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*bulletin of*  
**Duke University**  
**1998-99**

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*Nicholas School of the Environment*



## **The Mission of Duke University**

The founding Indenture of Duke University directed the members of the university to "develop our resources, increase our wisdom, and promote human happiness."

To these ends, the mission of Duke University is to provide a superior liberal education to undergraduate students, attending not only to their intellectual growth but also to their development as adults committed to high ethical standards and full participation as leaders in their communities; to prepare future members of the learned professions for lives of skilled and ethical service by providing excellent graduate and professional education; to advance the frontiers of knowledge and contribute boldly to the international community of scholarship; to foster health and well-being through medical research and patient care; and to promote a sincere spirit of tolerance, a sense of the obligations and rewards of citizenship, and a commitment to learning, freedom, and truth.

By pursuing these objectives with vision and integrity, Duke University seeks to engage the mind, elevate the spirit, and stimulate the best effort of all who are associated with the university; to contribute in diverse ways to the local community, the state, the nation, and the world; and to attain and maintain a place of real leadership in all that we do.

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**1998-99**

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*Nicholas School of the Environment*

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The information in this bulletin applies to the academic year 1998-99 and is accurate and current, to the extent possible, as of August 1997. The university reserves the right to change programs of study, academic requirements, teaching staff, the calendar, and other matters described herein without prior notice, in accordance with established procedures.

Duke University does not discriminate on the basis of race, color, national origin, handicap, sexual orientation or preference, gender, or age in the administration of educational policies, admission policies, financial aid, employment, or any other university program or activity. It admits qualified students to all the rights, privileges, programs, and activities generally accorded or made available to students. For further information, contact the equal opportunity officer (919-684-4736).

Information that the university is required to make available under the Student Right to Know and Campus Security Acts may be obtained from the Office of University Relations at 684-2823 or in writing to 615 Chapel Drive, Box 90563, Duke University, Durham, North Carolina 27708.

Duke University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404-679-4501) to award baccalaureates, masters, doctorates, and professional degrees.

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# University Administration

## GENERAL ADMINISTRATION

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Michael Israel, A.B., M.P.H., *Vice-Chancellor for Health Services and Executive Director, Duke University Hospital*  
David B. Adcock, J.D., *University Counsel*  
N. Allison Haltom, A.B., *Secretary of the University*  
William H. Willimon, M.Div., S.T.D., *Dean of the Chapel*

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Bertie S. Belvin, M.A., *Associate Dean for Academic Services*  
Cathy Hanby-Sikora, M.A., *Associate Dean for External Affairs*  
Joseph S. Ramus, Ph.D., *Director, Nicholas School of the Environment Marine Laboratory*  
John T. Sigmon, Ph.D., *Associate Dean*

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Zb Bornemann, *PC System Manager*  
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Gail Cannon, *Coastal Environmental Management Program Coordinator and Recruitment Specialist, Marine Laboratory*  
Charlotte Clark, M.E.M., *Director of the Center for Environmental Education*  
Clifton W. Davis, *Physical Plant Manager, Marine Laboratory*  
Judson D. Edeburn, M.F., *Duke Forest Resource Manager*  
Dianne R. Gagnon, *Business Manager, Marine Laboratory*  
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 Jonathan Chappell, *Nicholas School of the Environment, Durham, North Carolina, Student Representative*

# Calendar\*

1998

|                  |  |
|------------------|--|
| <b>August</b>    |  |
| 24               | Orientation for fall semester—Durham                     |
| 24-28            | Registration of new and nonregistered returning students |
| 31               | Fall semester classes begin—Durham                       |
| 31               | Orientation for fall semester—Marine Laboratory          |
| <b>September</b> |  |
| 2                | Fall semester classes begin—Marine Laboratory            |
| 11               | Drop/add ends  |
| <b>October</b>   |  |
| 12-13            | Fall break   |
| 28               | Registration begins for spring semester, 1999            |
| <b>November</b>  |  |
| 17               | Registration ends for spring semester, 1999              |
| 18               | Drop/add begins  |
| 25               | Thanksgiving recess (begins at 12:40 p.m. Wednesday)     |
| 30               | Classes resume   |
| <b>December</b>  |  |
| 4                | Fall semester classes end                                |
| 5-13             | Graduate reading period                                  |
| 19               | Fall term ends at Marine Laboratory                      |
| 14-19            | Final examinations                                       |

1999

|                |  |
|----------------|--|
| <b>January</b> |  |
| 11             | Orientation for spring semester                            |
| 12             | Registration of new and nonregistered returning students   |
| 14             | Spring semester classes begin—Durham and Marine Laboratory |
| 27             | Drop/add ends  |
| <b>March</b>   |  |
| 15-19          | Spring break   |
| 31             | Registration begins for fall semester, 1999                |
| <b>April</b>   |  |
| 15             | Registration ends for fall semester, 1999                  |
| 16             | Drop/add begins  |
| 23             | Spring semester classes end                                |
| 24             | Graduate reading period begins                             |
| <b>May</b>     |  |
| 2              | Graduate reading period ends                               |
| 3-8            | Final Examinations   |
| 8              | Spring term ends at Marine Laboratory                      |
| 16             | Commencement   |
| 17             | First summer term begins at Marine Laboratory              |
| <b>June</b>    |  |
| 18             | First summer term ends at Marine Laboratory                |
| <b>July</b>    |  |
| 19             | Second summer term begins at Marine Laboratory             |
| <b>August</b>  |  |
| 20             | Second summer term ends at Marine Laboratory               |

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\*The dates in the calendar are tentative and subject to change.



## TO THE PROSPECTIVE STUDENT

In 1991, Duke University signaled a new approach to education and research in marine and terrestrial ecosystems, earth sciences, and human-environment interactions with the inauguration of the School of the Environment. The School of the Environment's mission of providing education, research and service toward the understanding of basic environmental processes unites two centers of excellence with long and distinguished histories at Duke--the former School of Forestry and Environmental Studies and the Marine Laboratory. The school, with its unprecedented commitment to education and research addressing the quality of the Earth's environment and the sustainable use of its natural resources, is uniquely positioned, now, in the context of American higher education to lead the way in solving complex environmental problems in a rapidly changing world.

The programs of the Nicholas School of the Environment are based on the premise that the most challenging global environmental problems are so complex that they cannot be solved effectively within the context of a single discipline. Science can provide crucial research and data, but cannot supply the process for bringing that information to bear on the creation of regulatory policy; policy studies alone are often in danger of fostering the implementation of solutions with inadequate scientific bases; proposed solutions to environmental challenges that ignore the economic forces that will inevitably come to bear on them have little chance of success. An interdisciplinary approach is absolutely mandatory.

The Nicholas School of the Environment at Duke University, then, is committed to bringing together around crucial global problems the best scholars from the wide range of academic disciplines necessary to produce real, workable solutions to these problems, as well as to producing environmental managers and scholars that will become the leaders in these areas in years to come.

Our graduates are among the leaders of the nation's largest environmental consulting firms and industries with environmental interests, as well as the public agencies and nonprofit organizations that monitor, manage and regulate natural resources and the environment. We have proven that we are among the best at what we do.

Our objective, however, is not merely research published or students graduated. It is wise and sustained management of our natural resources and a better environment for this and future generations. We invite you to join us in pursuit of these goals.



Norman L. Christensen, Jr.  
*Dean, Nicholas School of the Environment*

*General Information*



## Introduction

The mission of the Nicholas School of the Environment is education, research, and service to understand basic environmental processes and to protect and enhance the environment and its natural resources for future generations. Intrinsic to this mission are (1) a commitment to interdisciplinary approaches, (2) a commitment to objective and, where possible, quantitative approaches, (3) a commitment to principles of ecological integrity, (4) a commitment to the sustainable use of natural resources, and (5) a commitment to environmental education at all levels. The overall objective is to assist in the definition and resolution of problems confronting society, through excellence in natural resource and environmental education and research.

The school's emphasis is on defining objectives for natural resource science and management, understanding the interrelated constraints—physical, biological, chemical, ecological, economic, legal and social—and devising and testing alternative management solutions. This approach to natural resource education is pursued through research, formal courses, field studies and seminars, and informally through interaction with practicing professionals by a variety of means.

Research and problem solving are integral to the school's mission. The faculty is engaged in a dynamic program of research, much of which is focused on contemporary natural resource and environmental issues, both terrestrial and marine, that are regional, national, and global in scope. Students are also encouraged to involve themselves in real world problems. As part of their professional degree requirements, students must complete a master's project requiring independent research and problem analysis.

Teaching and research in the Nicholas School of the Environment are focused within the following curriculums: coastal environmental management; environmental toxicology, chemistry and risk assessment; forest resource management; resource ecology; resource economics and policy; water and air resources; the ocean sciences; and the earth sciences. These programs are designed for students drawn from a wide variety of undergraduate backgrounds in the natural and social sciences, forestry, engineering, business and environmental studies. Program requirements enable all students to acquire the basic technical skills, scientific knowledge, insight and methods of analysis for resolving natural resource and environmental problems.

As a professional school within a private university, the Nicholas School of the Environment is able to foster independent consideration of natural resource and environmental issues without the political pressures often brought to bear upon public institutions. As part of a major research university, the school is able to add a significant dimension to teaching and research through cross-campus interdisciplinary degree programs, faculty appointments, and cooperative projects.

Additional enrichment is available through relevant departments at neighboring universities, as well as through agencies and institutions at the Research Triangle Park and in the Beaufort-Morehead City area. These opportunities for study and professional interaction place Duke in an enviable position among schools of resource science and management and greatly enhance the quality of its programs.

Alumni of the Nicholas School of the Environment hold leadership positions in public agencies, environmental and forestry consulting firms, private industry, and not-for-profit organizations throughout the nation and the world.



## History

Duke University developed from Union Institute, a small school established in 1838 in Randolph County, North Carolina. The name was changed to Normal College in 1851, and in 1859, to Trinity College. The college was moved to Durham in 1892. With the establishment of the James B. Duke Indenture of Trust in 1924, Trinity College became Duke University. At the outset, the university developed around a core of undergraduate programs.

In 1932, forestry instruction was offered for students of Trinity College, and in 1938 the School of Forestry was established as a graduate professional school under the direction of Dean Clarence F. Korstian. The Master of Forestry and Doctor of Forestry degrees were offered initially and later the A.M., M.S., and Ph.D. were offered through the Graduate School. The school's forestry program has been fully accredited by the Society of American Foresters since 1939.

Dr. Korstian joined the faculty in 1931 as the first director of the Duke Forest. Brought to Durham by Dr. William P. Few, president of Duke at the time, Dr. Korstian set out to develop a demonstration and research forest that would serve as a model for owners of small tracts of timber in the South. During the 1930s the faculty of the school was gradually expanded to include a number of research foresters who made substantial contributions to forestry in the Southeast. This faculty established and brought early recognition to the school.

Growing national concern with natural resources and environmental problems led to a new teaching and research emphasis in ecology in the 1970s. In 1974 the name was changed to the School of Forestry and Environmental Studies and a new degree was added, the Master of Environmental Management.

Duke University's Marine Laboratory also had its beginnings in the the 1930s when Dr. A.S. Pearse and colleagues from Duke were attracted to Pivers Island and its surrounding abundance of marine life for their summer field studies. The island afforded an excellent location for a field station and through the subsequent efforts of Dr. Pearse and others, the land was acquired for the Duke University Marine Laboratory. Construction began and by 1938 the first buildings were erected. Originally, the laboratory served only as a summer training and research facility. Today, it operates year-round to provide training and research opportunities to about 3,500 persons annually, including undergraduate, graduate and professional students enrolled in the university's academic programs; visiting student groups who use the laboratory's facilities; and scientists who come from North America and abroad to conduct research.

In 1991, the School of Forestry and Environmental Studies was combined with the Duke University Marine Laboratory to form the School of the Environment. The new school is an unprecedented university commitment to interdisciplinary education and research in environmental science, policy, and management. It is the only private graduate professional school of its type in the country. The school became the Nicholas School of the Environment in 1995 after a generous gift from Duke alums Peter and Virginia Nicholas.

## Location

Duke University is situated on the outskirts of Durham, a city of over 198,000 inhabitants, in the central Piedmont region of North Carolina. The Appalachian escarpment lies approximately 100 miles to the west of Durham and the coastal plain is but a short distance to the east. The Marine Laboratory is located 180 miles to the east of Durham, on Pivers Island within North Carolina's Outer Banks, adjacent to the historic town of Beaufort. The school is thus ideally situated near areas of ecological and topographic diversity which offer many opportunities for study as well as recreation.

Piedmont North Carolina is characterized by a rolling, forested topography interspersed with small farms and rural communities in addition to the state's largest cities. The climax forests of the piedmont are hardwoods; however, human disturbance has resulted in the establishment of many forests of the native southern pines.

The southern Appalachians are widely known for their unusual history, picturesque topography, and wide range of flora and fauna. Here the typical hardwood forests which dominate at lower elevations give way to forests of spruce and fir at higher elevations. The region's numerous recreation areas are widely used for hiking, fishing, skiing, and other outdoor activities.

The coastal plain of North Carolina, well known for its agricultural production, is used extensively by many of the nation's forest industries for plantations of the native pines. Coastal wetlands and estuaries, now recognized as one of the nurseries of world fisheries, offer abundant and valuable natural resources. North Carolina's Outer Banks and the barrier islands of the other southeastern states serve as protection for these coastal waters. The rapidly increasing population and development in this region make proper management of its natural resources particularly important to the nation.

Because of the school's central location near these regions of vital ecological importance, students are afforded the opportunity to study many current environmental problems in the field. Both the opportunity and the challenge exist to analyze these pressing problems and to develop sound approaches to their management.

## Facilities

The Nicholas School of the Environment is housed in the Levine Science Research Center, an interdisciplinary research facility situated at the corner of Science Drive and Research Drive on the West Campus. The building includes state-of-the-art classrooms, research laboratories and instrumentation supporting both teaching and research for the programs offered by the school. A lounge, reading room, and computer laboratories are provided for students. Fully equipped modern teaching and research facilities for the ocean sciences are available at the school's coastal campus in Beaufort, N.C.

**Computer Facilities.** Duke's Computer Assist Center works in partnership with members of the university community to enable them to achieve their academic and research goals through computing. The center provides access to a variety of computing facilities and services through DukeNet, a high-speed data network, and various types of telecommunications linkages. The center maintains extensive MS-DOS/Windows and Macintosh personal computer and DEC workstation facilities at a number of locations on the Durham campus and at Beaufort. All laboratories and clusters are equipped with either dot matrix or laser printers and several are connected to the campus telecommunications network. Electronic mail services are available for faculty and graduate students.

Other services include access to the Internet data network and the Cray Y-MP/432 and massively parallel computing at the North Carolina Supercomputing Center and other supercomputer centers. Access to Duke's IBM ES/9000 mainframe computer is also available through the Computer Assist Center.

**Libraries.** The combined university libraries, including the main Perkins Library and twelve other school or branch libraries, contain over 4,200,000 volumes. About 150,000 volumes are added annually. The collection includes about 9,500,000 manuscripts and over 2,000,000 public documents.

The Biology-Forestry Library, located in the Biological Sciences Building, contains over 170,000 volumes and receives nearly 1,000 periodicals related to natural resources and the environment.

The Pearse Memorial Library on the Beaufort campus is a branch of the Duke library system. It holds approximately 23,000 volumes with a concentration on the marine



sciences and subscribes to 55 scientific journals. Support services include interlibrary loan and on-line literature search capabilities. Cooperative agreements provide access to the libraries of the National Oceanic and Atmospheric Administration, National Marine Fisheries Service, University of North Carolina Institute of Marine Sciences, and the University of North Carolina at Wilmington.

**Greenhouses and the Phytotron.** Adjoining the Biological Sciences Building on Duke's West Campus are excellent facilities for biological investigations under controlled conditions. The phytotron contains 50 separately controlled growth chambers and greenhouses which can be used to grow plants under a variety of environmental conditions. The phytotron is one of few such facilities in the United States.

**Research Triangle Park.** Numerous industrial and governmental organizations have established research facilities in the Research Triangle Park, ten miles from the Duke campus. Government facilities include the National Environmental Research Center of the Environmental Protection Agency, the Forestry Sciences Laboratory of the United States Forest Service Southeastern Forest Experiment Station, and the National Institute of Environmental Health Sciences. These laboratories provide opportunities for student research and internships in some of the nation's most advanced research facilities.

**Coastal Resources.** The Beaufort-Morehead City area provides location for five facilities that collectively house one of the higher concentrations of marine scientists in the nation. These are the University of North Carolina's Institute of Marine Sciences, the North Carolina State University Seafood Laboratory, the North Carolina Aquarium at Bogue Banks, North Carolina Division of Marine Fisheries; and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, Beaufort Laboratory. This concentration of marine scientists provides a critical mass for the pursuit of science and education.

**Neighboring Universities.** Through a reciprocal agreement, Duke students may supplement their education in forestry and the environmental sciences by taking courses in related fields at the University of North Carolina in Chapel Hill, North Carolina State University in Raleigh, and North Carolina Central University in Durham. Graduate students of Duke University and the University of North Carolina at Chapel Hill are granted library loan privileges in both universities.

## The Duke Forest

The Duke Forest comprises about 8,000 acres of land in five major divisions and several smaller tracts. A 10-minute walk from campus will take one well into many parts of the Durham Division, and a network of roads and fire trails makes almost all areas of the forest easily accessible.

The forest lies primarily in Durham and Orange counties, near the eastern edge of the piedmont plateau, and supports a cross section of the woodlands found in the upper coastal plain and lower piedmont of the Southeast. A variety of timber types, plant species, soils, topography and past land use conditions are represented. Elevations range from 260 to 760 feet. Soils of the region are derived from such diverse parent materials as metamorphic rock of the Carolina slate formation, granite, Triassic sedimentary rock, and basic intrusives.

The Duke Forest, as it is known today, had its origins in the mid-1920s when the university administration bought many small farms and interspersed forest land as buffer areas for the main campus and as an investment for the future. The forest was placed under intensive management in 1931 by Dr. Clarence Korstian, its first director. In its early development, several basic objectives were emphasized: (1) demonstration of timber management techniques on a practical and economic basis, (2) development

of an experimental forest for research in the sciences associated with timber growing, and (3) development of the area as an outdoor laboratory for students of forestry.

Modification of these early objectives has arisen, in part, through a greatly increased interest and dependence on the forest for research in the areas of zoology, botany, and ecology by faculty and students at Duke and neighboring universities. Background information useful to researchers is provided by the forest; it covers such features as soils, topography, inventory, plantation, and cultural records as well as a bibliography of past and current studies. Current work on problems associated with developmental pressures at the urban-rural interface and integrated approaches to natural resource management have multiplied the forest's value and benefit as a resource.

Since 1976, the Duke Forest has been included in a nationwide network of research sites selected by the Institute of Ecology under a program sponsored by the National Science Foundation. These sites, designated as experimental ecological reserves, were selected to provide a wide range of conditions and habitat types for long-term scientific research in a multitude of disciplines.

The forest also serves in an educational and recreational capacity for residents of the Durham and Chapel Hill communities. Hiking, picnicking, jogging, and nature study are particularly popular pastimes.

This natural outdoor laboratory is an invaluable supplement to the instructional, research, and recreational facilities of the school, the university, and the region. The Duke Forest—in terms of its size, diversity, proximity to campus, and more than sixty years of accumulated research data is a natural resource unequaled at any other academic institution.



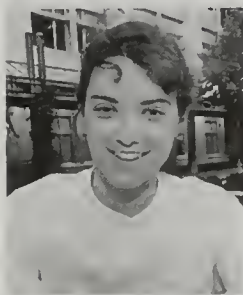
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## *Faculty*





## Core Faculty



**Dianne Ahmann, Ph.D.**, *Assistant Professor of Microbial Ecology*; B.A., Biochemistry and Molecular Biology, Harvard College; Ph.D., Biology, Massachusetts Institute of Technology.

E-mail: [dianne@duke.edu](mailto:dianne@duke.edu)

Dr. Ahmann's research concerns the roles of microorganisms in the biogeochemical cycling of metals and trace elements. Microbially-catalyzed oxidations and reductions are of particular interest because they can dramatically alter chemical properties and consequent behavior of metallic elements in natural systems. Her current research investigates the physiology and ecology of anaerobic arsenic-respiring bacteria which gain energy by coupling organic carbon oxidation to arsenic reduction in a process analogous to the energy-yielding oxygen reduction carried out by aerobes. Arsenic mobility is greatly increased by this reduction, accelerating local arsenic cycling and suggesting applications in removing arsenic from contaminated solids.

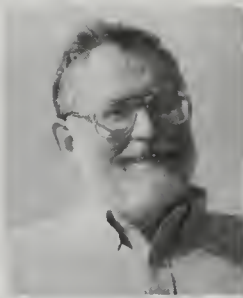
Additional research is planned to explore a possible interaction between certain soil bacteria and plants under iron-limiting conditions common in alkaline soils. In this interaction, microbial metabolism of root-secreted phenolic molecules may lead to reduction of insoluble iron(III) in iron oxyhydroxides to the more available iron(II), improving iron nutrition and consequent growth potential in plants.



**Paul A. Baker, Ph.D.**, *Professor of Geology*; B.A., Geology, University of Rochester; M.S., Geology, Pennsylvania State University; Ph.D., Earth Sciences/Marine Geology, University of California, San Diego.

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The primary theme of Dr. Baker's research is the geochemistry of fluids and sediments, especially for the purposes of understanding sedimentary diagenesis, the depositional history of sediments, or the reconstruction of past climate. Some of Dr. Baker's work on modern processes is done at sea utilizing oceanographic research vessels. Typically, this may include observations of pore-fluid geochemistry and sedimentology of materials collected by box coring, piston coring or deeper drilling. Some of his work on modern processes is done in the laboratory by experimental hydrothermal syntheses of common diagenetic mineral phases and observation of the conditions of their formation. His studies of ancient rocks utilize more traditional procedures: measuring and sampling of stratigraphic sections in the field and complete mineralogical, chemical, and isotopic analyses of these samples in the laboratory. Because of the diverse nature of the methodology employed for these studies, Dr. Baker (by necessity and by choice) is a geological generalist.



**Richard T. Barber, Ph.D.,** *Harvey W. Smith Professor of Biological Oceanography and Professor of Botany and Zoology; B.S., Zoology and Botany, Utah State University; Ph.D., Biological Science, Stanford University.*

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Dr. Barber's research in carbon cycling by ocean processes has implications for climate regulation. At Duke he investigates the interrelationship of large-scale thermal dynamics and ocean basin productivity, emphasizing (1) how biological and physical processes contribute to the exchange of carbon dioxide between the ocean and the atmosphere and (2) how the "biological pump" transfers carbon into the deep sea. With current field work being carried out on cruises in the southern ocean, his research group is focusing on the role of physical conditions in regulating primary production and phytoplankton performance. He is also investigating the role of a single micronutrient, iron, in the regulation of primary production in a part of the ocean, the equatorial Pacific, where a high nutrient/low chlorophyll character persists despite physical and chemical conditions which otherwise favor high productivity.

He is in residence at the Marine Laboratory.

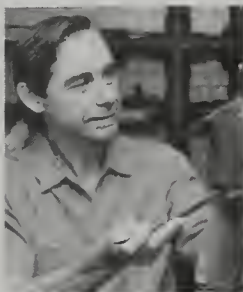


**Celia Bonaventura, Ph.D.,** *Professor of Cell Biology; B.A., Zoology, San Diego State University; Ph.D., Biochemistry, University of Texas, Austin.*

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Most of Dr. Celia Bonaventura's research is in the area of structure/function relationships of oxygen and electron-transport proteins. This continues to be her primary area of research, with an increasing focus on environmental perturbations of structure and function. Her research makes use of structural assays and complementary measurements of rapid reaction kinetics and equilibria, using UVMS and fluorescence spectroscopy and spectroelectrochemistry. Through comparison of human proteins with proteins of species inhabiting diverse environments, studies by Dr. Bonaventura and collaborators have increased the understanding of structural mechanisms that allow respiratory proteins to satisfy widely different physiological and environmental demands. Her current research concerns aspects of environmental toxicity associated with free-radical interactions with respiratory proteins and structural alterations of respiratory proteins that are indicative of exposure to xenobiotics.

She is in residence at the Marine Laboratory.



**Joseph Bonaventura, Ph.D.,** *Professor of Cell Biology; B.A., Zoology, San Diego State University; Ph.D., Biochemistry, University of Texas, Austin.*

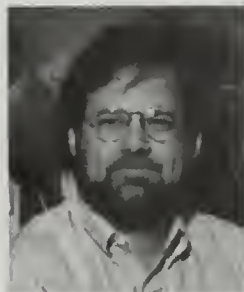
E-mail: joeb@acpub.duke.edu

Dr. Joseph Bonaventura's research involves marine organisms found in diverse environments. Biochemical studies on the structural and functional diversity of these organisms has been shown to be paralleled by diversity at the molecular level. Red cells and respiratory proteins of marine organisms are being studied in order to increase the understanding of molecular adaptations and the mechanisms that give rise to functional flexi-



bility. The kinetics and equilibria of ligand binding to hemoglobins, hemocyanins, and cytochrome c oxidase are studied with emphasis on the reactivity of these proteins as regulated by metabolic effectors. These studies are complemented by work in the Protein Engineering and Technology Laboratory where properties of chemically modified, crosslinked, and immobilized forms of biologically active molecules are characterized. Recent research concerns the development of a synthetic blood substitute for humans. The project involves a detailed study of structure-function relationships in the human hemoglobin molecule and includes site-directed mutagenesis of hemoglobin genes. A new focus concerns the biochemistry of nitric acid in the human body and the development of a hypothesis of how this simple molecule might act as a regulator of the biosphere.

He is in residence at the Marine Laboratory.



**Alan E. Boudreau**, Ph.D., *Associate Professor of Geology*; B.S., Geology, University of California; M.S., Geology, University of Oregon; Ph.D., Geology, University of Washington.

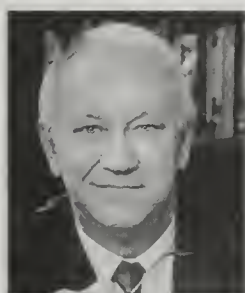
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Dr. Boudreau's research has focused on understanding the crystallization of large layered intrusions, with particular attention on the Archean Stillwater complex in Montana. Although the classic bodies such as the Stillwater Complex have been extensively studied for many years, there is still little agreement on how the rocks formed. Besides the intriguing problems proposed for the crystallization of magmas, these intrusions are

host to important mineral reserves of Cu, Ni, Cr, Ti and the platinum-group elements.

Much of Boudreau's recent work has investigated the degassing history of these intrusions and the role of volatiles in the formation of the platiniferous ore zones hosted by both the Stillwater Complex and the Bushveld Complex in South Africa. He and his coauthors have shown that the halogen geochemistry of Stillwater and Bushveld hydrous mineral phases is distinctly much more Cl-rich than are seen in other, barren, layered intrusions. Current work is investigating the details of the stratigraphic variation of the halogens and the possibility of redistribution of Cl-complexed trace elements.

Another set of studies has focused on the mechanisms by which igneous layering may develop. These attempt to show that many examples of igneous layering may develop slowly over time and have more textural affinity with metamorphic differentiation layering.

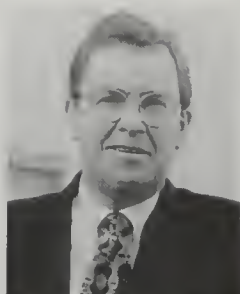


**James S. Clark**, Ph.D., *Associate Professor of Earth Sciences and of Botany*; B.S., Entomology, North Carolina State University; M.S., Forestry, University of Massachusetts; Ph.D., Ecology, University of Minnesota.

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Dr. Clark holds joint appointments in Earth and Ocean Sciences and Botany. His research explores the factors responsible for ecosystem patterns and how they respond to long-term changes in the physical environment, especially fire. His research projects address the influences of long-term climate change on fire regimes and forest composition; climate and soil effects that result

in spatial patterns of species composition, and effects of past fire on carbon cycling and composition of the atmosphere.



**Norman L. Christensen, Jr., Ph.D.,** *Professor of Ecology; B.A., M.A., Biology, California State University, Fresno; Ph.D., Biology, University of California, Santa Barbara.*

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Dr. Christensen is interested in the effects of disturbance on the structure and function of populations and communities. On-going studies include an analysis of patterns of forest development following cropland abandonment as these are affected by environment, stand history, and plant demographic patterns. This research focuses on the historical data sets and resources of the Duke Forest. He is also conducting research on the southeastern coastal plain and

western Sierra Nevada focused on a comparison of biogeochemical and community responses to varying fire regimes. These studies are aimed at an understanding of the evolutionary and ecosystem consequences of fire and the application of such information in the development of wilderness management and policy protocols. In addition, Dr. Christensen is conducting research on the use of remote sensing systems, such as synthetic aperture radar, to evaluate long-term changes in forest ecosystems.



**Sherri L. Cooper, Ph.D.,** *Assistant Research Professor; B.S., Botany, Duke University; M.S., Marine Studies, University of Delaware; Ph.D., Physical Geography, Johns Hopkins University.*

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Dr. Cooper's interests include using paleoecological tools to recreate the history of water quality and vegetation changes in aquatic systems and watersheds, related to both climatic influences and anthropogenic effects. This type of data is important for historical perspectives for management decisions in coastal and aquatic watershed land-use. Her specialties include estuarine systems and diatom analysis. Current research is focused on the

recent history of the Everglades, to recreate the vegetation, water quality, and fire history over the past 200 years for use in restoration plans.



**Bruce H. Corliss, Ph.D.,** *Professor of Earth & Ocean Sciences; B.A., Geology, University of Vermont; M.S., Oceanography, University of Rhode Island; Ph.D., Oceanography, University of Rhode Island.*

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Dr. Corliss was on the staff of the Woods Hole Oceanographic Institution for six years before joining the Department of Geology in 1984. As a geological oceanographer, he is interested in Cenozoic paleoceanography and studies marine microfossils and deep-sea sediments. His early work dealt with the distribution of Quaternary deep-sea benthic foraminifera in the Southern Ocean and their relationship with present and past deep bottom water circulation patterns.

This effort was followed by studies of Eocene-Oligocene paleoceanography based on the analysis of microfossils and sediments from Deep Sea Drilling Project samples. An ancillary aspect of his research has been in deep-sea sedimentation. A study of Cenozoic sedimentation in the Pacific was based on a synthesis of sedimentological, geochemical, and paleontological data from a red clay sequence. A second sedimentological study dealt with carbonate sedimentation beneath the Antarctic Circumpolar Current. Dr. Corliss' current research deals with the ecology of living deep-sea benthic foraminifera using data from box core samples taken on a number of oceanographic cruises in the Atlantic, Pacific, and Arctic Oceans.



**Larry B. Crowder, Ph.D.,** *Professor of Marine Ecology; B.A., Biology and Mathematics, California State University, Fresno; M.S., Ph.D., Zoology, Michigan State University.*

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Dr. Crowder's research centers on predation and food web interactions, mechanisms controlling recruitment variation in fishes, and on population modeling in conservation biology. He has studied food web processes in estuaries and lakes, and has used observational, experimental and modeling approaches to understand these interactions in an effort to improve fisheries management. He is a member of the Program Management

Committee for SABRE (South Atlantic Bight Recruitment Experiment), a NOAA-funded project that focuses on identifying the unique characteristics of survivors of a cohort of fishes and links those characteristics to physical or biological variability. He has also been involved in population modeling and data analysis to address various management scenarios for threatened and endangered species. He and his students have developed life-history population models to address various management problems including exotic species introductions, acidification, habitat modification, bycatch and harvest for both freshwater and marine fishes.

He is in residence at the Marine Laboratory.



**Richard T. Di Giulio, Ph.D.,** *Associate Professor of Environmental Toxicology; B.A., Comparative Literature, University of Texas; M.S., Wildlife Management, Louisiana State University; Ph.D., Wildlife Biology, Virginia Polytechnic Institute and State University.*

E-mail: [richd@duke.edu](mailto:richd@duke.edu)

Dr. Di Giulio's research group in environmental toxicology is chiefly involved with integrated basic and applied research in aquatic biochemical toxicology. Basic studies focus on xenobiotic metabolism and modes of action in lower vertebrates and invertebrates, particularly fishes. Results of these studies are used

to develop sophisticated, sensitive biochemically based indices (biomarkers) of environmental quality. He is particularly interested in the application of free radical biology theory to the elucidation of mechanisms of contaminant metabolism and toxicity in aquatic animals, mechanisms, promutagen activation and DNA damage, mechanism of reproductive and developmental toxicity and mechanisms of adaptation to environmental contaminants.



**Richard B. Forward, Jr., Ph.D.,** *Professor of Zoology; B.S., Biology, Stanford University; Ph.D., Biology, University of California, Santa Barbara.*

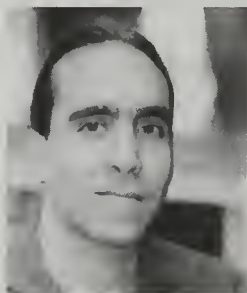
E-mail: [rforward@acpub.duke.edu](mailto:rforward@acpub.duke.edu)

Dr. Forward and his students investigate the behavior and physiology of estuarine and coastal zooplankton. This includes the photobehavior, photophysiology, biological rhythms, diurnal vertical migration, and horizontal migration of crustacean and fish larvae. Past studies have worked with crustaceans and chaetognaths to determine the effects of temperature, salinity, and feeding on phototaxis and geotaxis, salinity perception, and polarized light perception. Field studies have looked at horizontal and vertical distributions as related to environmental factors. Additional studies involve rhythms in egg hatching by crustaceans. Types of rhythms, flexibility, and the involvement of peptide



pheromones are being considered.

He is in residence at the Marine Laboratory.



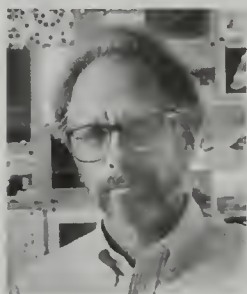
**Jonathan H. Freedman, Ph.D.,** *Assistant Professor of Environmental Toxicology; B.A., Microbiology, Rutgers University; M.S., Ph.D., Molecular Pharmacology, Albert Einstein College of Medicine.*

E-mail: jonf@duke.edu

Dr. Freedman's research is directed toward understanding the regulatory mechanisms controlling an organism's response to environmental stress. In particular, he is interested in how they are exposed to toxic concentrations of heavy metals. He is investigating these processes using the microscopic soil nematode, *Caenorhabditis elegans*, as a model system. *C. elegans* is archetypical for the study of development, signal transduction and gene regula-

tion in a whole organism. Results from this research will help elucidate how an organism adapts to an increasingly toxic environment.

A second area of his research focuses on understanding the mechanism of gene regulation of the metal-binding protein, metallothionein. Multiple factors including those involved in metalloregulation, development, and cell specificity must coordinately interact to activate metallothionein gene transcription. He is using in vivo techniques to monitor gene activity, RNA accumulation, and protein expression in individual cells within the nematode. As a result of this research, genetically engineered nematodes have been developed that may be used as biomonitors for environmental toxins.



**Peter K. Haff, Ph.D.,** *Professor of Geology and Civil and Environmental Engineering; B.A., Physics, Harvard University; Ph.D., Physics, University of Virginia.*

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Dr. Haff applies quantitative modeling techniques including computer simulation to describe and predict the course of natural geological processes that occur on the surface of the earth. His research interests include the physics of blowing sand, the motion of sand dunes, the mechanics of sedimentary bedforms, and the transport of sedimentary particles by flowing water. Field work being carried out by Dr. Haff on desert pavements in the

southwest US shows that these ancient geomorphic surfaces are dynamically active today. Understanding the dynamics and history of desert pavement provides a framework for assessing the stability of these extensive desert landforms and for interpreting paleoclimatic events that have influenced their development. Dr. Haff is also studying the effects of human disturbance on natural landscapes. Field experiments and observations are being carried out in the Mojave Desert in California in an attempt to assess the future prospects for this desert environment as human activity there continues to expand.

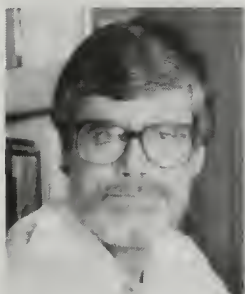


**Patrick N. Halpin, Ph.D.,** *Assistant Professor of the Practice of Landscape Ecology; B.A., International Studies, MPA, International Management, George Mason University, Ph.D., Environmental Sciences, University of Virginia.*

E-mail: phalpin@duke.edu

Dr. Halpin's research interest is in landscape ecology, GIS and remote sensing, and international conservation management. His research activities include spatial and statistical analysis of vegetation structure and climate-vegetation interactions; simulation modeling of vegetation dynamics; Geographic Information Systems analysis; ecological applications of remote sensing;

and protected area management analysis. Dr. Halpin is currently participating as an investigator in research projects sponsored by the USEPA, NASA, NBS, and EPRI. These projects involve the spatial simulation of forest vegetation cover and environmental conditions in boreal forests of North America, mixed forests of the Southeastern Piedmont, Southern Appalachian Mountain forests and mixed conifer forests of the Sierra Nevada. A central focus of these projects has been the development of techniques for the more realistic inclusion of topographic moisture controls of forest patterns and fire regimes in these ecosystems. Dr. Halpin also has a special research interest in the application of GIS and spatial analysis techniques to environmental management of international protected areas, and has recently worked on global change analysis in tropical regions.

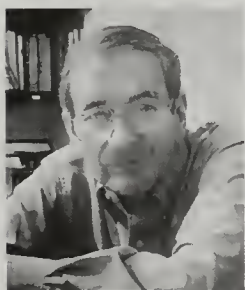


**Robert G. Healy, Ph.D.,** *Professor of Environmental Policy; B.A., M.A., Ph.D., Economics, University of California, Los Angeles.*

E-mail: healy@duke.edu

Dr. Healy works on land-use and environmental policy in the United States and developing countries. Before coming to Duke in 1986, he was senior associate at The Conservation Foundation/World Wildlife Fund in Washington, D.C. His past research has resulted in books on state land-use planning, coastal zone management in California, rural land markets, national forest policy, resource and environmental problems of agriculture, and environmental policy in developing countries. He has

a continuing interest in land use policy in fast-growing areas, particularly the U.S. South and rural areas affected by rapid migration or by tourism. Dr. Healy teaches courses on land-use and environmental policy and on conservation and sustainable development in the Third World.



**S. Duncan Heron, Jr., Ph.D.,** *Professor of Geology; B.S., M.S., Geology, University of South Carolina; Ph.D., Geology, University of North Carolina.*

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Dr. Heron's research interests are broad within the area of sedimentary geology. Previous studies included the Cretaceous and Tertiary clastic sequences in the Atlantic Coastal Plain. Fifteen abstracts and twenty-five articles have resulted from this area of study. More recent work has been on the Holocene history of a barrier island system on both limbs of the Cape Lookout foreland (North Carolina Outer Banks). Eleven abstracts and nine

publications have resulted from this study. Two studies of the clay deposits in Georgia have been funded by industry. One project looked at the clastic facies and origin of the lower Tertiary claybearing sequence. Another study has been on the economic Creta-



ceous clays in a mine in central Georgia. This study focused on the nature of the clay body and its vertical and lateral variations in clay mineralogy, texture, etc. Dr. Heron is the editor-in-chief of *Southeastern Geology*, a journal which is published at Duke, and Secretary-Treasurer of the Carolina Geological Society.



**Jeffrey A. Karson, Ph.D.,** *Professor of Geology; B.A., Geology, Case Institute of Technology; M.S., Ph.D., Geology, State University of New York, Albany.*

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Dr. Karson joined the Duke faculty in January 1986 after 7 years as a member of the scientific staff at Woods Hole Oceanographic Institution. The central theme of his research is structural and tectonic analysis of rift and transform plate boundaries. His approach involves the systematic collection of geological data in order to determine the geometry, chronology, and mode of formation of outcrop-scale deformation structures and their relation to crustal processes that operate on a regional scale. In order to gain insights into the evolution of rifts and transforms, Dr. Karson has worked in several different environments. In the East African Rift System, detailed structural studies define the geometry and kinematics of active rifting and the birth of a rifted continental margin. Investigations of the ocean-continent transition and coastal dike swarms of the Tertiary East Greenland volcanic rifted margin are underway in collaboration with the Danish Lithosphere Center. Along the Mid-Atlantic Ridge and East Pacific Rise, spreading centers and intervening transform faults are examined from the perspective of the submersible ALVIN and various other seafloor mapping tools. Studies of ophiolite complexes, ancient oceanic lithosphere exposed in mountain belts, reveal the deep structure of crust and upper mantle produced by seafloor spreading. Integrating these diverse studies has proven to be useful in developing new models of crustal deformation in extensional and strike-slip tectonic regimes.



**Prasad Kasibhatla, Ph.D.,** *Assistant Research Professor of Environmental Chemistry; B.S., Chemical Engineering, University of Bombay; M.S., Ph.D., Chemical Engineering, University of Kentucky.*

E-mail: psk9@duke.edu

Dr. Kasibhatla has fifteen years of experience in tropospheric chemistry and transport modeling. His modeling studies have focused on elucidating the factors affecting regional air quality and the global atmospheric budgets of reactive nitrogen compounds, ozone, carbon monoxide, and sulfur compounds. One particular area of interest for Dr. Kasibhatla is the effects of anthropogenic emissions on atmospheric composition and reactivity, as well as on marine and terrestrial ecosystems.



**Gabriel G. Katul, Ph.D.,** *Assistant Professor of Hydrology; B.E., Civil Engineering, American University of Beirut; M.S., Civil Engineering, Oregon State University; Ph.D., Civil Engineering, University of California, Davis.*

E-mail: [gaby@duke.edu](mailto:gaby@duke.edu)

Dr. Katul's research focuses on hydrology and fluid mechanisms in the environment. In particular, he is interested in heat and water transport in the vadose zone and its importance in characterizing surface layer turbulence. He has carried out many laboratory and field experiments to characterize the parameters of heat and momentum transport mechanisms across the land-atmosphere interface and to determine their relationship to the local and regional hydrologic budget.

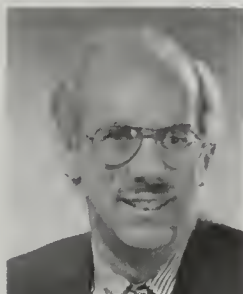
Recent work has centered on various aspects of hydrology and environmental fluid mechanics such as (1) heat and momentum fluxes over complex watershed terrain, (2) heat and water movement in unsaturated field soils, (3) the structure of turbulence close to the land-atmosphere interface, and (4) the impact of hydrologic processes on the spatial structure of soil moisture content.



**Richard F. Kay, Ph.D.,** *Professor of Biological Anthropology and Anatomy and of Geology; B.S., Anthropology and Zoology, University of Michigan; M. Phil., Ph.D., Geology and Geophysics, Yale University.*

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Dr. Kay's current research interests center on the evolutionary history of the Order Primates. He is especially interested in further documenting the fossil history of Neotropical monkeys, whose history is particularly poorly known. Another focus of his research has been the use of quantitative methods to understand the dietary adaptations of the teeth of living primates. Dr. Kay is chairman of Duke's Department of Biological Anthropology and Anatomy.



**Robert O. Keohane, Ph.D.,** *James B. Duke Professor of Political Science, B.A., Social Sciences, Shimer College; Ph.D., Political Science, Harvard University.*

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Dr. Keohane's research focuses on the role of international institutions, including international environmental regimes such as the Montreal Protocol on Substances that Deplete the Ozone Layer and organizations such as the Global Environment Facility. He is interested in the conditions under which such institutions form and gain membership and authority. His research is also designed to explore how such institutions can become effective in promoting concern about the environment, facilitating international environmental cooperation, and strengthening national environmental policies. A recent project, *Institutions for Environmental Aid* (ed. Keohane and Levy) explored the operation of institutions designed to promote environmental protection in poor countries by transferring resources from richer ones. His current research includes participation in a project on global environmental assessments, which is designed to explore the conditions that affect these exercises, and their effects on environmental policy and behavior. He also works on other issues involving the roles played by institutions in American foreign policy and world politics more generally.



**William W. Kirby-Smith, Ph.D.,** *Associate Professor of the Practice of Marine Ecology; B.S., Biology, University of the South; Ph.D., Zoology, Duke University.*

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Dr. Kirby-Smith's research interests involve effects of land development on estuarine water quality, invertebrae zoology, benthic ecology and estuarine ecology. His recent research projects include the following: (1) ecology of rock outcrop communities on the continental shelf; (2) effects of salt marsh modifications on plant, invertebrate, fish and bird communities; (3) influence of pine plantation drainage on water quality and benthic invertebrates in receiving estuarine headwaters; (4) effects of agricultural development upon hydrology, water quality and biology in estuarine headwaters; and (5) the fate of fecal coliform bacteria in storm water runoff and estuarine headwaters. Additional research interests include the physiology of suspension feeding and its ecological consequences in estuaries.

He is in residence at the Marine Laboratory.



**Emily M. Klein, Ph.D.,** *Assistant Professor of Geology; B.A., English, Barnard College; M.A., Geology, M. Phil., Ph.D., Geology, Columbia University.*

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Dr. Klein completed her graduate studies at Lamont-Doherty Geological Observatory of Columbia University. The primary focus of her research is the geochemistry of ocean ridge basalts, using diverse tools of major and trace element and isotopic analysis. On a global scale, Dr. Klein has shown that world-wide variations in basalt composition correlate with both the depth of the ridge axis and the thickness of the oceanic crust. Dr. Klein is currently investigating the extent to which basalt composition can be used to map mantle temperature variations and possible mantle convection patterns. Dr. Klein's most recent sea-going expedition involved mapping and sampling of the Chile Ridge near its intersection with the Chile Trench.

Other on-going or recently completed projects include analysis of the first fresh ocean ridge basalts recovered from the Pacific-Antarctic Ridge; investigation of the relationship between basalt composition and physical characteristics of the ridge in the Australian-Antarctic Discordance south of Australia; and a study of the isotopic diversity of samples from the northern East Pacific Rise.



**Kenneth R. Knoerr, Ph.D.,** *Professor of Environmental Meteorology and Hydrology; B.S.F., Forestry, University of Idaho; M.F., Ph.D., Forestry, Yale University.*

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Dr. Knoerr's research emphasizes investigations of the processes by which plants interact with the atmosphere. This research is approached from two perspectives. The first is the development of physical models for the plant-environment interaction. The second, in parallel with the modeling, is an extensive experimental effort to collect data on the gradients of radiation, wind, temperature, humidity, carbon dioxide and other environmental parameters that characterize the microclimate of forests.

His research group is involved in an intensive study to measure and model the characteristics of air flow within the forest. These models will increase the understanding of



the turbulent exchange of gases between forest vegetation and the atmosphere, the diffusion patterns of disease spores and pollen within the forest, and the mechanisms by which forests remove aerosols from the atmosphere.

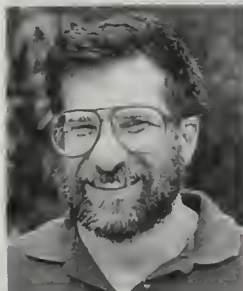


**Randall A. Kramer, Ph.D.,** *Professor of Resource and Environmental Economics; B.A., Economics, University of North Carolina; M.E., Economics, North Carolina State University; Ph.D., Agricultural Economics, University of California, Davis.*

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Dr. Kramer's research area is environmental economics with a focus on environmental valuation, benefit-cost analysis, and quantitative policy analysis. An ongoing study in Indonesia on the economics of protected areas is examining nature tourism, agricultural and forest extraction in buffer zones, and watershed protection benefits. Other recent research includes economic

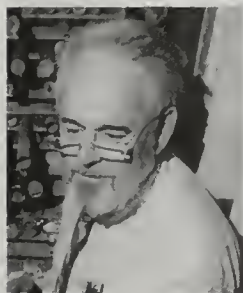
studies of (1) protected area management in Madagascar, (2) air pollution damages to high elevation Southern Appalachian forests, (3) an assessment of Hurricane Hugo damage to endangered species habitat in the U.S., and (4) the value of rain forest protection as a global public good. Much of the environmental valuation work of his research team has focused on measuring the existence value of ecosystems and the extension of non-market valuation methods to a developing country context. He has also done studies on the economics of biodiversity protection policies and wetlands protection programs. A new area of research is economic incentives for local participation in coral reefs management.



**Michael Lavine, Ph.D.,** *Associate Professor of Statistics and Decision Sciences and of Environment; B.S., Mathematics, Beloit College; M.S., Mathematics, Dartmouth College; Ph.D., Statistics, University of Minnesota.*

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Dr. Lavine has joint appointments at Duke in statistics (primary) and the environment (secondary). His primary research interests are in robust and nonparametric Bayesian statistical theory and environmental statistical applications.



**Daniel A. Livingstone, Ph.D.,** *James B. Duke Professor of Zoology and Professor of Earth and Ocean Sciences; B.S., Biology, M.S., Zoology, Dalhousie University; Ph.D., Zoology, Yale University.*

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Dr. Livingstone studies the circulation and chemical composition of lakes in tropical Africa and how the distribution and abundance of organisms are affected by them. The aim is to understand tropical lakes as climatically-controlled ecological systems, and especially how the environment controls the properties of lake sediments. This understanding is used with

cores taken from lake sediments to work out the history of changing climate and changing vegetation. The ultimate aim is two-fold: to understand global climatic change and to see how the climatic history of Africa has affected the plants and animals that live there. Among the most interesting of those organisms are *Homo sapiens* and its hominid ancestors.



**M. Susan Lozier, Ph.D.,** *Assistant Professor of Physical Oceanography; B.S., Chemical Engineering, Purdue University; M.S., Chemical Engineering, Ph.D., Oceanography, University of Washington.*

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Dr. Lozier's research interests lie in the general area of mesoscale and large-scale ocean dynamics. Specifically, she is interested in the Lagrangian aspects of ocean circulation, cross-frontal exchange processes and climate dynamics. Her approach to the study of these topics ranges from the application of numerical models to the analysis of observational data, with the focus on the testing and development of theory.

Currently, Dr. Lozier is studying the decadal variability of the North Atlantic Ocean, using historical hydrographic data from the period 1904 to 1990. A major objective of this work is to identify climatic anomalies during the past century and to determine the dynamics that govern their propagation. The Mediterranean outflow and the Labrador Sea are areas of particular interest. Current work is also focused on how local instabilities convolute a shelfbreak front and lead to mixing of shelf and slope waters.



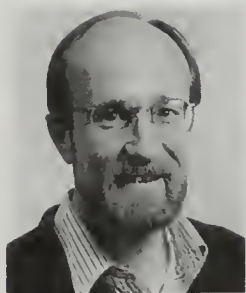
**Lynn A. Maguire, Ph. D.,** *Associate Professor of the Practice of Environmental Management; A.B., Biology, Harvard University; M.S., Resource Ecology, University of Michigan; Ph.D., Ecology, Utah State University.*

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The major area of Dr. Maguire's current research is the application of formal techniques for decision making under uncertainty to the resolution of environmental conflicts. Decision analysis provides a framework for integrating scientific information from ecological theory and empirical studies with economic and public policy considerations affecting the management of natural resources.

Using these techniques, Dr. Maguire and her students are studying multiple-use land management in southern Appalachian national forests and values of forested wetlands. Beyond these specific research projects, she is interested in (1) the application of population dynamics, population genetics and ecological theory to the conservation of animal and plant populations; (2) the use of decision analysis to resolve disputes in endangered species management and land-use planning; and (3) the use of quantitative methods to integrate scientific information in resource management.





**Peter E. Malin, Ph.D.**, *Associate Professor of Seismology and Associate Professor of Civil and Environmental Engineering*; B.S., Geophysics, Stanford University; M.S., Marine Geophysics, Stanford University; Ph.D., Seismology, Princeton University.

E-mail: pem@geo.duke.edu

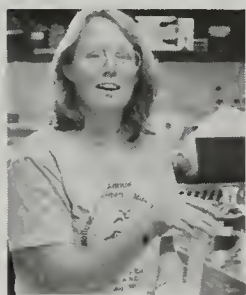
Dr. Malin joined Duke Geology in 1991 after more than a decade as a research seismologist at the University of Southern California and the University of California. His interests include tectonics, seismic wave propagation, and earthquakes, with current focus on central California. Since seismic waves are inseparable from the geology in which they originate and travel, his research has become increasingly interdisciplinary, emphasizing the application of structural and mechanical models to seismic observations. Current projects at Duke include the mechanics of the San Andreas fault at Parkfield, the seismotectonics of the Coso Geothermal area, and seismic exploration of the southern Sierra Nevada, Owens Valley, and San Joaquin regions. The Duke-associated downhole seismometer networks at Parkfield and Coso have revealed patterns in seismicity that suggest the interaction of aseismic and seismic fault slip. Along with several other universities, the Duke seismology group determined the location of crossed, 300 km long refraction profiles in the Sierra Nevada/Death Valley region in 1993. The seismic networks offer the chance for hands-on study of seismicity and earthquake mechanics. The active seismic profiling projects provide experience with seismic imaging of crustal structure.



**Carol A. Mansfield, Ph.D.**, *Assistant Professor of Environmental Economics*; B.A., Economics, Yale University; Ph.D., Economics, University of Maryland.

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Dr. Mansfield's research interests include the areas of environmental and public economics, with an emphasis on quantitative analysis. Her current research focuses on the use of contingent valuation surveys to price environmental resources and the individual decision-making processes. This work has two primary goals. The first is to evaluate how people react to hypothetical survey questions and whether their answers contain information that is useful to policy makers. The second is to explore alternatives to the standard economic model of decision making and the implications for environmental policy. A secondary issue is the use of contingent value surveys to devise methods of compensating communities that agree to accept lower environmental quality, for example, allowing a landfill to be built in their area. In addition to this, she has begun research on the effect of environmental regulations on the location decisions of businesses.



**Patricia D. McClellan-Green, Ph.D.**, *Assistant Research Professor*; B.S., M.S., Biology, East Carolina University; Ph.D., Toxicology, North Carolina State University.

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Dr. McClellan-Green studies gene regulation and expression by aquatic organisms in response to xenobiotic exposure. Research is under way to determine the mechanism of PAH and PCB mediated gene regulation in fish. Other areas of interest include the identification and characterization of various cytochrome P-450s in aquatic organisms and the genetic regulation of select P-460 genes. She is in residence at the Marine Laboratory.



**Marie Lynn Miranda, Ph.D.,** *Assistant Professor of the Practice of Environmental Policy; A.B., Economics and Mathematics, Duke University; M.A., Ph.D., Economics, Harvard University.*

E-mail: mmiranda@duke.edu

Dr. Miranda's primary research is in natural resource and environmental economics, with an emphasis on interdisciplinary, policy-oriented perspectives. Her research includes analysis of the institutional and economic factors that shape forest management practices, both in the United States and in the tropical developing world. She has worked in Indonesia, Malaysia, Nepal, Costa Rica, and Honduras. In addition, Dr. Miranda carries out research to assess the effectiveness of market-based incentives and pollution prevention policies on the management of domestic solid waste. She teaches courses on American environmental policy, developing country environmental policy, environmental sciences and policy, and general microeconomics.



**Michael K. Orbach, Ph.D.,** *Professor of the Practice of Marine Affairs and Policy; B.A., Economics, University of California, Irvine; M.A., Ph.D., Cultural Anthropology, University of California, San Diego.*

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Dr. Orbach's research interests are in the application of social and policy sciences to coastal and ocean policy and management. His work uses a cultural, or human, ecology perspective to analyze human behavior in coastal and ocean environments. His current research projects include (1) the development and application of limited entry and effort management systems to marine fisheries; (2) the formation and socioeconomic impact of marine minerals policy; (3) marine mammal and endangered species-fisheries conflicts; and (4) citizen involvement in coastal and ocean policy.

Dr. Orbach specializes in the application of science to the policy and management process. He is in residence at the Marine Laboratory.



**Ram Oren, Ph.D.,** *Associate Professor of Ecology/Ecophysiology; B.S., Forest Resource Management, Humboldt State University; M.S., Ph.D., Forest Ecology, Oregon State University.*

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Dr. Oren's research examines ecological phenomena of plant interaction in relation to the environment. He is particularly interested in the nutritional dynamics of plants as affected by nutrient supply and demand. In tropical ecosystems, he studies the seasonal hydrological budget and the size and frequency of ecological groups.

In Germany, Dr. Oren's research on forest decline led him to construct a conceptual model of nutritional disharmony. The model describes the differential effects of imbalanced nutrition on plant growth and function. The model is being tested locally in pine and mixed pine-hardwood plantations. He is also testing the link between remotely-sensed data and ground measurements made in the Rio Bravo Reserve, Belize. The objective is to partition forest types into smaller stands of vegetation based on sets of ecophysiological characteristics and to quantify the effect of land-use alterations on the seasonal hydrological cycle.



Ronald D. Perkins, Ph.D., *Professor of Earth Sciences*; B.S., Geology, University of Cincinnati; M.S., Geology, University of New Mexico; Ph.D., Geology, Indiana University.

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Dr. Perkins came to Duke University in 1968 after spending 6 years as a Research Geologist with Shell Development company. He continues his association with industry through consulting activities and in the teaching of short courses primarily in the fields of carbonate facies analysis diagenesis. Dr. Perkins' current research interests are focused on the Pleistocene and Holocene carbonates of the Turks and Caicos Islands in the British

West Indies and oil field analogs. He and his co-workers have recently described oolite deposition in settings far removed from the shelf margin where they are generally considered to form. His students have recently conducted studies on the mineralogy and pore water chemistry of schizohaline pond sediments on West Caicos and the evolution of a Holocene carbonate mound near the island of Providenciales. Studies by students on ancient carbonates are also encouraged to provide better integration between modern sediment studies and ancient analogs. More recently these studies have included projects on the Cambro-Ordovician Knox of the Southern Appalachians, and the Jurassic Smackover Limestone of the Gulf Coast.



Orrin H. Pilkey, Ph.D., *James B. Duke Professor of Earth Sciences*; B.S., Geology, Washington State College; M.S., Geology, University of Montana; Ph.D., Geology, Florida State University.

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Dr. Pilkey's research centers on both basic and applied coastal geology, focusing primarily on barrier island coasts. Off Wrightsville Beach, NC, advantage is being taken of a petrographically distinct beach replenishment sand to determine paths of sand transport on the shoreface. Another ongoing project involves a detailed study of the evolution of salt marshes

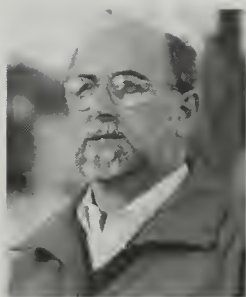
along various shoreline types in Pamlico and Albermarle Sounds. The goal is to understand how salt marshes in various geological settings will respond to a future rise in sea level and how this impacts on management strategies for salt marshes.

Recently, Dr. Pilkey's group, along with INGEOMINAS, carried out the first phase of a study of the Colombian Pacific Coast barrier island chain. Future studies will involve detailed coring of selected individual islands to determine how barrier islands evolve in tectonically active areas completely away from the influences of humans.

Applied studies are carried out under the auspices of the Program for the Study of Developed Shorelines (PSDS). Such studies have included a review of the national beach replenishment experience on all 3 U.S. coasts and analysis of the validity of replenished beach engineering design parameters.

The PSDS group is currently exploring, from a geologic viewpoint, methods for mitigating hurricane damage on barrier islands. The PSDS is also analyzing the numerical models used by coastal geologists and engineers to predict the movement of beach sand, especially on beach replenishment projects.





**Joseph S. Ramus, Ph.D.,** *Professor of Biological Oceanography; A.B., Ph.D., Botany, University of California, Berkeley.*

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Dr. Ramus's research includes the study of physical forcing of primary productivity in coastal plains estuaries. The research seeks a match between physiological response and the temporal frequency of physical drivers, the phasing of the organism with its environment. Another of Dr. Ramus's interests involves biotechnological research which includes extracellular polysaccharides produced by marine microphotoautotrophs. Two aspects are under investigation: (1) environmental regulation of carbon

partitioning; i.e., the diversion of newly fixed carbon from growth (new photosynthetic machinery) to disposable heteropolysaccharides (viscoelastic biopolymers), and (2) drag reducing properties of the biopolymers in pipe flow.

A third area under investigation is photoacclimation and photoinhibition in seaweeds and seagrasses. Of specific interest are macromolecular changes in the photosynthetic apparatus, the dynamic range of change and the effect of change on growth rate.

He is in residence at the Marine Laboratory.



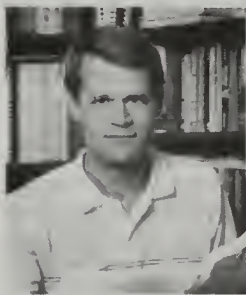
**Andrew J. Read, Ph.D.,** *Assistant Professor of the Practice of Marine Mammalogy; B.S., M.S., Ph.D., Zoology, University of Guelph.*

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Dr. Read studies the life history and conservation biology of dolphins, porpoises, and other marine mammals. He conducts life history research through longitudinal studies of individuals in coastal populations and cross-sectional studies of samples from strandings or incidental catches in commercial fisheries. In these studies, he focuses attention on how animals partition energy among the competing demands of growth, maintenance and reproduction.

He also examines the impacts of human activities on populations of marine mammals and attempts to find solutions to such conflicts. In particular, he studies the effects of removals from populations caused by incidental mortality in commercial fisheries. This work is multifaceted and involves examination of animal behavior around nets, modification of fishing gear to minimize mortality, and demographic analyses of the effects of incidental catches.

He is in residence at the Marine Laboratory.



**Kenneth H. Reckhow, Ph.D.,** *Professor of Water Resources; B.S., Engineering Physics, Cornell University; M.S., Ph.D., Environmental Science and Engineering, Harvard University.*

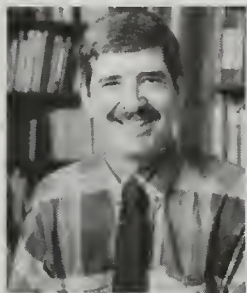
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Dr. Reckhow's research activities have focused on the development, evaluation, and application of models for the management of water quality. In particular, he is interested in the effect of uncertainty on model specification, parameter estimation, and model applications. Recent work has expanded this theme to consider the effect of scientific uncertainties on water quality decision making.

Among the problems that Dr. Reckhow's research group has examined are lake eutrophication, toxic substances, and acid rain. Past work on eutrophication has centered on the development and evaluation of empirical models, estimation of prediction



uncertainty using first order error analysis and Monte Carlo simulation, and a decision analytic approach to lake management. Current work by Dr. Reckow and his students concerns errors-in-variables and parameter identification in mechanistic models.

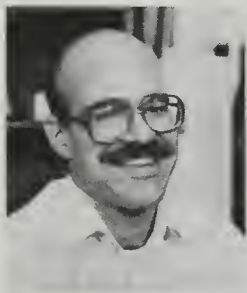


**Curtis J. Richardson**, Ph.D., *Professor of Resource Ecology*; B.S., Biology, State University of New York at Cortland; Ph.D., Ecology, University of Tennessee.

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Dr. Richardson's research interests in applied ecology center on long-term ecosystem response to large-scale perturbations such as acid rain, toxic materials, flooding, or nutrient additions. He has specific interests in wetland ecosystems, phosphorus nutrient dynamics, and the effects of environmental stress on plant metabolism and growth. Major research focuses on wetlands as nutrient sinks.

His current research activities include: (1) the effects of nutrient additions and hydrology on Everglades phosphorus retention and community changes; (2) heavy metal sorption, storage and removal from drained pocosin peatlands; (3) wetland development trends in the southeastern United States; and (4) mechanisms for iron and manganese removal in constructed wetlands used for the improvement of coal mine drainage.



**Daniel D. Richter**, Ph.D., *Associate Professor of Forest Soils and Ecology*; B.A., Philosophy, Lehigh University; Ph.D., Forest Soils, Duke University.

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Dr. Richter's research objectives are centered on understanding and quantifying soil change that is affected by long-term forest development and land use. His work is directed at quantifying how nutrient and hydrologic cycles control the chemistry of forest soils, drainage waters and forest productivity. His scientific interests in these topics are motivated by a desire to improve the management of soil-plant-watershed systems to support

long-term human use. The responses of poorly buffered soils are of most interest, most particularly extremely weathered, acidic Ultisols that are common to the southeastern United States and to the forests of the humid tropics. His research objectives are pursued both individually and cooperatively with scientists from several disciplines. His primary educational objectives are to help students develop an understanding of and appreciation for ecological functions of soil and forest ecosystems through lectures, seminars, field trips, and indoor and outdoor laboratories.



**Daniel Rittschof**, Ph.D., *Associate Professor of Zoology*; B.S., Ph.D., Zoology, University of Michigan.

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Dr. Rittschof's research interests involve chemical communication systems. His studies include external and internal molecular mediation of behavior (chemical ecology). At present, test systems are marine and include crustaceans (true crabs, hermit crabs and barnacles), molluscs and fish. Studies span the gamut from practical (nontoxic antifouling coatings, fish foods and fish feeding stimulants) to purely basic (larval release pheromones, designer peptides with biological activity, hermit crab shell attractant cues, hormonal control of feeding behavior, and enzymatic activities in crustacean and gastropod saliva).

The driving theme of the work is the evolution of chemical

communication systems and their components.

He is in residence at the Marine Laboratory.



**Stuart Rojstaczer**, Ph.D., *Associate Professor of Geology and Civil and Environmental Engineering*; B.S., Geology, University of Wisconsin; M.S., Geology, University of Illinois; Ph.D., Applied Earth Sciences, Stanford University.

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The broad aim of Dr. Rojstaczer's research is to understand better the role of subsurface fluid flow in geologic and human-induced hazards. A subsidiary interest is in the development of new techniques to determine elastic and fluid flow properties of the Earth in situ.

Dr. Rojstaczer and his students have recently examined many research topics including: land subsidence in the San Joaquin-Sacramento Delta (a region critical to water supply in California); groundwater flow induced by tectonic activity along the San Andreas Fault; the mechanics of geysers; measurement of air permeability in the field; rates of flow and residence times of fluids in karst; and interpolation of permeability structure in the presence of sparse data.

Central to the approach of examining these problems is the integration of field-derived data with theory. The research frequently requires the use of novel field collection techniques or the use of conventional techniques in novel settings. The field data is used to constrain quantitative models that describe the physical and chemical processes underlying the observations.

He is director of the Center for Hydrologic Science.



**Edwin Romanowicz**, Ph.D., *Assistant Research Professor*; B.S., Earth Sciences (Geophysics), B.A., Mathematics, University of California at Santa Cruz; M.S., Ph.D., Geology, Syracuse University.

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Dr. Romanowicz's research interests are surface and groundwater hydrology with a particular interest in wetland hydrology and groundwater/lake interactions. Presently, Dr. Romanowicz is studying the modern and paleo-hydrology of the Everglades in South Florida. This research involves detailed measurements of surface-water elevation and water velocity. In addition he is working with the Environmental Research Institute of Michigan to develop remote sensing as a tool for investigating the affects of land use changes on the surface hydrology of the Everglades.

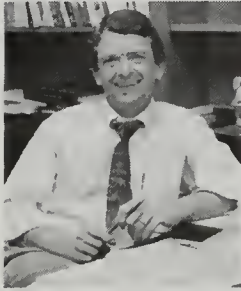


**William H. Schlesinger**, Ph.D., *James B. Duke Professor of Biogeochemistry*; A.B., Biology, Dartmouth College; Ph.D., Ecology and Systematics, Cornell University.

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Dr. Schlesinger's research interests span the field of global change science, focusing on human induced changes in the global biogeochemical cycles. He maintains an active program of field research in the southwestern United States, where he examines the causes and consequences of desertification in arid-land ecosystems. In a variety of synthetic papers, he has provided estimates of the amount of soil organic matter in world soils, the rate of change in this pool due to human activities and the transport of organic com-

pounds from land to sea in riverflow. The pool of carbon in soils is one of the largest surface reservoirs in the global carbon cycle, and losses of soil organic matter upon cultivation contribute to the increasing concentration of CO<sub>2</sub> in the atmosphere. Many of Dr. Schlesinger's estimates are frequently seen in models of the global carbon cycle. Dr. Schlesinger holds a joint appointment in the Departments of Botany and Earth Sciences.



**John T. Sigmon, Ph.D.,** *Associate Professor of the Practice of Environmental Science; A.B., Chemistry, Ph.D., Forest Meteorology, Duke University.*

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Dr. Sigmon's research has focused on surface-atmosphere interactions over complex terrain with an emphasis on chemical transformations and deposition. One component of this research has addressed the linkages between surface layer processes and the larger scale flows in the planetary boundary layer.

Currently, Dr. Sigmon is working on a research project attempting to identify and quantify the non-methane hydrocarbons emitted from various types of tree species and the development of methods for field measurements of these compounds.



**V. Kerry Smith, Ph.D.,** *Arts and Sciences Professor of Environmental Economics, A.B., Ph.D., Economics, Rutgers University.*

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Dr. Smith's research interests are in environmental economics and applied microeconomics. His current research involves the use of different methods to measure the economic value of nonmarketed environmental resources, such as the use of random utility models to describe recreation demand, hedonic models for coastal amenities, and contingent valuation surveys to estimate the values people place on cleaning up or improving

environmental resources.

Another area of research involves incorporating environmental resources into computable general equilibrium models of economies. Two applications involve air pollutants in the European Community and coastal water related resources in the southeastern United States. Dr. Smith's research focuses on modeling how individuals deal with risks (including radon, pesticide residues and cholesterol) that differ in their temporal effects and prospects for mitigation. Other projects investigate the development of recreation values for reducing marine pollution, the measurement of the trade consequences of environmental policy, the incorporation of nonmarket services into measures of GDP, and the calibration of nonmarket valuation methods.





**Laura K. Snook**, Ph.D., *Assistant Professor of the Practice of Conservation Biology and Director of the Duke/TNC Program in Applied Conservation Biology*; B.A. History, Grinnell College; M.F.S., Tropical Forestry, Doctor of Forestry, Forest Ecology and Silviculture, Yale University.

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Dr. Snook is primarily interested in the application of ecological knowledge to the management and conservation of forests. Her research has focused on forest stand dynamics, disturbance ecology, and silviculture as well as social forestry and forest conservation. She has worked in highland (fir and pine), montane, and lowland tropical forests in Mexico, and has ongoing research projects in the mahogany forests of Mexico, Belize, and Brazil.

Within The Nature Conservancy, her role consists of carrying out and facilitating research to answer questions applicable to ecosystem management on TNC landholdings, with the participation of Duke NSOE students and faculty. She is also working with TNC to evaluate and enhance the potential of socially and economically viable forestry to sustain biodiversity. In the southeastern United States, her work will focus on the longleaf pine ecosystem and the forests of the Roanoke River floodplain.



**Craig A. Stow**, Ph.D., *Visiting Assistant Professor of Water Resources*; B.S., Environmental Technology, Cornell University; M.S., Marine Sciences, Louisiana State University; Ph.D., Environmental Modeling, Duke University.

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Dr. Stow's research interests focus on the application of statistical modeling techniques to assist with management decisions in aquatic ecosystems. His work has included assessments of sediment-water nutrient interactions in lakes, patterns of contaminant bioaccumulation in Great Lakes fishes, and the effect of observation error on parameter estimation and model prediction. Dr. Stow's current research includes a study of food-web effects and fish growth rates on PCB bioaccumulation in Lake Michigan, a study of nutrient loading patterns in the Neuse River estuary, and an assessment of phosphorus levels in the Florida Everglades.



**John Terborgh**, Ph.D., *James B. Duke Professor of Environmental Science*; B.S., Biology, M.S., Ph.D., Plant Physiology, Harvard University.

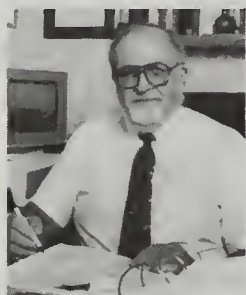
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Dr. Terborgh's interests lie in the fields of tropical ecology and conservation. At different times in his career he has studied birds, primates, herbs, and forest trees, and has directed student projects involving butterflies, lizards, amphibians, and crocodilians. The common denominator in all this work has been the goal of solving problems of general ecological interest using a comparative approach. Some typical comparisons have involved seasonal patterns in resource utilization by forest primates, habitat use by Amazonian birds, and latitudinal variation in the structure of mature forests.

Applications of ecology to conservation have increasingly become a central theme of his work. He regards as particularly important the need to understand



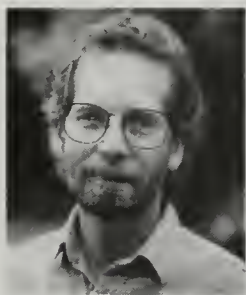
the many consequences of habitat fragmentation, especially those related to the disruption of trophic level processes.



**Jerry J. Tulis, Ph.D.**, *Adjunct Associate Professor of Environmental Studies; B.S., Bacteriology, University of Illinois; M.S., Medical Microbiology, Loyola University; Ph.D., Radiobiology, Catholic University of America.*

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Dr. Tulis is primarily interested in the detection, amelioration, and prevention of adverse health effects in the occupational and environmental setting as a result of exposure to biohazardous agents and materials. Specifically, he is interested in (1) the improvement of indoor environments from the viewpoint of bio-aerosols, including the identification and control of harmful aerosols composed of opportunistic and pathogenic microorganisms, biological toxins, and allergens; (2) the mitigation of hazardous waste using bioremediation technology; (3) research on the development of biocidal materials; (4) the development of preventive measures to limit zoonotic infections in various zoologic and field operations; and, (5) the control of mycotoxin production resulting from the growth of various saprophytic fungi in the agricultural setting. His current research involves studies on the growth-promoting potential of fungal contaminants of fiberglass duct lining and duct board, and nationwide risk assessment studies for the EPA on occupational and environmental biohazards in various workplaces, including laboratories, Superfund sites, and marine operations.



**Dean L. Urban, Ph.D.**, *Assistant Professor; B.A., Botany and Zoology, M.A., Wildlife Ecology, Southern Illinois University; Ph.D., Ecology, University of Tennessee.*

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Dr. Urban's research interest is in landscape ecology: the development and implications of landscape pattern. He uses simulation models to explore the interplay of abiotic environmental templates (temperature, moisture gradients), biotic processes (plant demography, competition, dispersal), and disturbances (including human land use) in governing forest dynamics in mountain landscapes. One current project uses a model as a framework for comparisons among forests in the Oregon Cascades, the Sierra Nevada of California, the White Mountains of New Hampshire, and the southern Appalachians of North Carolina.

Building on his work in forests, Dr. Urban is also interested in wildlife communities in patchy landscape mosaics. His focus is on how landscape pattern and metapopulation processes interact to generate landscape-scale patterns in biodiversity. One emphasis of this research is to use models, interfaced with geographic information systems, to explore alternative forest management strategies.



**Carel P. van Schaik, Ph.D.,** *Professor of Biological Anthropology and Anatomy and of Environment; B.S., Biology, M.S., Ethology and Plant Ecology, Ph.D., Ethology, Utrecht University.*

Email: [cschaik@duke.edu](mailto:cschaik@duke.edu)

Dr. van Schaik is a tropical ecologist and ethologist with Duke's Department of Biological Anthropology and Anatomy. His ecological research focuses on fungivores in tropical rain forests and their response to resource seasonality and disturbance. He is also interested in strategies of conserving biological diversity.



**P. Aarne Vesilind, Ph.D.,** *Professor of Civil and Environmental Engineering and of Environment; B.S., M.S., Civil Engineering, Lehigh University; M.S., Sanitary Engineering, Ph.D., Engineering, University of North Carolina at Chapel Hill.*

Email: [pav@egr.duke.edu](mailto:pav@egr.duke.edu)

A professor in Duke University's School of Engineering, Dr. Vesilind researches wastewater and sludge management and disposal, and the development of solutions to solid waste and resource recovery problems.



**Jonathan B. Wiener, J.D.,** *Associate Professor of Law and of Environment; A.B., Economics, Harvard College; J.D., Harvard Law School.*

Email: [wiener@law.duke.edu](mailto:wiener@law.duke.edu)

A member of the Duke Law School faculty, Mr. Wiener is interested in the interplay of science, economics, and law in addressing environmental and human health risks. Before coming to Duke, he worked in the area of environmental policy at the White House Council of Economic Advisers and Office of Science and Technology Policy, and at the United States Department of Justice. He also helped organize the environmental component of the Americorps national service program. His policy work and writing have addressed topics including climate change, forests conservation, risk, biotechnology, mass torts, and incentives in regulation and litigation. He attended the Rio Earth Summit in 1992. In 1997 he was elected President-elect of the Society for Risk Analysis, Research Triangle Chapter.



**Robert L. Wolpert**, Ph.D., *Associate Professor of Statistics and Decision Sciences and of Environment*; A.B., Mathematics, Cornell University; Ph.D., Mathematics, Princeton University.

Email: [rwolpert@stat.duke.edu](mailto:rwolpert@stat.duke.edu)

A member of Duke's Institute of Statistics and Decision Sciences, Dr. Wolpert is interested in the theory and foundations of statistical inference and in the application of advanced mathematical, numerical and statistical methods to the modeling and study of environmental and biological systems. His current research stresses the study of model selection, model validation, and uncertainty analysis for environmental simulation and risk-assessment models.

Originally trained as a mathematician specializing in probability theory and stochastic processes, he was drawn to statistics by the interplay between theoretical and applied research.

## Extended Faculty

**S. Marshall Adams**, Ph.D., *Adjunct Professor*; B.S., Wildlife Biology, M.S., Zoology, North Carolina State University; Ph.D., Marine Science, University of North Carolina at Chapel Hill.

Dr. Adams is principal investigator of several large projects at Oak Ridge National Laboratory related to effects of environmental stress on aquatic ecosystems. His research interests are in the general areas of environmental impact assessment and biological indicators of aquatic ecosystem health.

**Marius Brouwer**, Ph.D., *Adjunct Professor*; B.S., Biology, M.S., Biochemistry and Microbiology, Ph.D., Biochemistry, University of Groningen, The Netherlands.

Dr. Brouwer heads the toxicology section at the University of Southern Mississippi Institute for Marine Sciences/Gulf Coast Research Laboratory. His research interests center around the study of the dual role of metals and oxygen as essential and toxic elements in biological systems, using marine organisms as experimental animals.

**Russell C. Cattley**, Ph.D., *Adjunct Assistant Professor*; B.S., Rutgers University; M.S., Clemson University; V.M.D., University of Pennsylvania; Ph.D., University of North Carolina.

Dr. Cattley's areas of scientific interest are chemical carcinogenesis and toxicologic pathology. He serves as associate manager of the Cancer Program at the Chemical Industry Institute of Toxicology located in the Research Triangle Park.

**Fei Chai**, Ph.D., *Adjunct Assistant Professor*; B.S., Shandong College of Oceanology, P.R.China; M.A., Princeton University; Ph.D., Duke University.

Dr. Chai is assistant professor of oceanography at the School of Marine Sciences, University of Maine. He is currently involved in research collaboration with Professor Barber of the Nicholas School.

**Yi Chao**, Ph.D., *Adjunct Assistant Professor*; B.S., Atmospheric Physics, University of Science and Technology of China; M.A., Geophysical Fluid Dynamics, Ph.D., Atmospheric and Ocean Sciences, Princeton University.

Dr. Chao's research interests seek to improve our understanding of the general circulation of the ocean and to determine its role in the Earth system and global climate. He is a member of the technical staff at the Jet Propulsion Laboratory of the California Institute of Technology.

**Michael P. Dieter**, Ph.D., *Adjunct Professor*; B.S., University of Notre Dame; M.A., Ph.D., Zoology, University of Missouri.

Dr. Dieter is a physiologist and science editor for *Environmental Health Perspectives*



at the National Institute of Environmental Health Sciences. His research interests lie in the area of environmental toxicology of metals, mammalian toxicology and carcinogenesis, and cellular biochemistry and physiology.

**George R. Dubay, Ph.D.,** *Adjunct Assistant Research Professor*; B.S., Chemistry, Fairfield University; Ph.D., Physical Organic Chemistry, Duke University.

Director of instrument operations in Duke's chemistry department, Dr. Dubay is interested in mass spectrometry methods to identify and quantitate environmental contaminants and biochemically interesting compounds.

**David S. Ellsworth, Ph.D.,** *Adjunct Assistant Professor*; B.S., Biological Sciences, Cornell University; Ph.D., Forestry, University of Wisconsin, Madison.

Dr. Ellsworth currently participates in research in the Duke Forest concerning the physiological effects of carbon fluxes on pines under ambient and elevated inputs of carbon dioxide. He is a plant physiologist in the biosystems and process sciences division of Brookhaven National Laboratory.

**Dale A. Gillette, Ph.D.,** *Adjunct Professor of Geology*; B.A., Astronomy, M.S., Ph.D., Meteorology, University of Michigan, Ann Arbor.

Dr. Gillette, physical scientist at the NOAA Air Resources Laboratories, is interested in eolian processes and has concentrated on mechanisms of wind erosion and applications to geology and ecology. He has provided information on many of the mechanisms of wind erosion.

**Gary S. Hartshorn, Ph.D.,** *Adjunct Professor*; B.S., Biology, Moravian College; M.S., Botany, North Carolina State University; Ph.D., Forest Resources, University of Washington.

Dr. Hartshorn serves as director of Duke University's Organization of Tropical Studies. He maintains long-term research interests in tropical forest dynamics, dominance-diversity patterns, and sustainable management.

**Milton S. Heath, Jr., J.D.,** *Adjunct Professor*; A.B., Harvard University; LL.B., J.D., Columbia University.

Dr. Heath specializes in environmental and natural resource law and administration, and the legislative and other governmental aspects of resource development. He is on the faculty of the Institute of Government at the University of North Carolina at Chapel Hill.

**George R. Hendrey, Ph.D.,** *Adjunct Professor*; B.A., Zoology, M.S., Water and Air Resources, Ph.D., Limnology, University of Washington.

Dr. Hendrey is head of the Biosystems and Process Sciences Division at Brookhaven National Laboratory and co-director of the Forest-Atmosphere Carbon Transfer and Storage (FACTS) project operating in the Duke Forest. His primary research interests are in ecology and the development of integrated field experiments for ecosystem analysis.

**Thomas P. Holmes, Ph.D.,** *Adjunct Assistant Professor*; B.S., M.S., Agricultural Economics, University of Connecticut; Ph.D., Economics, Ohio Wesleyan University.

Dr. Holmes is a research forester with the USDA Forest Service's Economics of Forest Protection and Management work unit at Research Triangle Park, NC. His research focuses on the application of nonmarket valuation methods to problems of forest ecosystem protection and conservation in the United States and Brazil.

**Peter A. Howd, Ph.D.,** *Adjunct Assistant Professor*; B.A., Geology and Economics, Williams College; M.S., Ph.D., Oceanography, Oregon State University.

Dr. Howd's studies focus on how waves and currents interact to determine the evolution of beach morphology, and how changing global weather patterns may alter the evolution of undeveloped shorelines. Having served on the Nicholas School faculty at the Duke Marine Laboratory since 1992, he is a recent addition



to the faculty of the Department of Marine Science, University of South Florida.

**Eric S. Kasischke**, Ph.D., *Adjunct Assistant Research Professor*; B.S., Natural Resources, M.S., Remote Sensing, Ph.D., Remote Sensing and Forest Ecology, University of Michigan.

Dr. Kasischke is a research engineer in the Earth Sciences division of the Environmental Research Institute of Michigan. His research revolves around two primary interests: utilization of airborne and satellite imagery to study characteristics and patterns of change in forested landscapes, and development of methods to monitor the location, areal extent and damage of fires in Alaskan boreal forests.

**Gregory L. Kedderis**, Ph.D., *Adjunct Associate Professor*; B.S., Chemistry, Worcester Polytechnic Institute; Ph.D., Biochemistry, Northwestern Medical and Dental School.

Dr. Kedderis' research interests include mechanisms of toxicity of drugs and xenobiotics; genotoxicity and chemical carcinogenesis; xenobiotic oxidation by cytochromes P540; biotransformations of chemicals; enzymology; and the relationship between chemical dosimetry and biological effects. He is a Scientist II at the Chemical Industry Institute of Toxicology, Research Triangle Park.

**E. Ann LeFurgey**, Ph.D., *Adjunct Associate Research Professor*; B.S., Biology, Chemistry, Maryville College; M.S., Ph.D., Marine Sciences, University of North Carolina, Chapel Hill.

Director of the analytical electron microscopy facility in Duke University Medical Center's Department of Cell Biology, Dr. LeFurgey is a cell physiologist with interest in the mechanisms of toxic injury in cells elicited by metals and organic pollutants. Her laboratory is one of few worldwide which focuses on the application of quantitative electron probe x-ray microanalysis and imaging to problems in environmental health and toxicology.

**Steven T. Lindley**, Ph.D., *Adjunct Assistant Professor*; B.A., Aquatic Biology, University of California, Santa Barbara; Ph.D., Botany and Geology, Duke University.

Dr. Lindley is an ecologist in NOAA's National Marine Fisheries Service at the Southeast Fisheries Science Center, Tiburon Laboratory, California. His research interests focus on ecosystem and population ecology, numerical modeling, and application of stable isotopes as tracers of ecological processes.

**D. Evan Mercer**, Ph.D., *Adjunct Assistant Professor*; B.S., Biology, B.S., Zoology, University of Texas; M.S., Forest Ecology, University of Michigan; Ph.D., Natural Resource Economics, Duke University.

Dr. Mercer is a research economist with the USDA Forest Service's Southern Research Station at Research Triangle Park, NC. His current research interests are the economics of agroforestry; nonmarket valuation; rural development; and the effects of government policies, market factors, and societal values on the management and protection of tropical forest resources, properties of lake sediments.

**Brian C. Murray**, Ph.D., *Adjunct Assistant Professor*; B.S., Economics and Finance, University of Delaware; M.S., Ph.D., Resource Economics and Policy, Duke University.

Dr. Murray is a senior economist at the Research Triangle Institute's Center for Economics Research. His areas of specialization include economic analysis of environmental policies and programs, analysis of industry structure and competition, and economic modeling of land use.

**John Nagy**, Ph.D., *Visiting Research Scientist*; B.S., Physics, Massachusetts Institute of Technology; Ph.D., Experimental High Energy Physics, University of Pennsylvania.

Dr. Nagy's research interests focus on environmental physics; effects of radiation and energy system effluents on human health and natural ecosystems; and hardware and software related to automated control, data acquisition, and diagnostics for

scientific experiments.

**Narendra P. Sharma**, Ph.D., *Adjunct Professor*; B.S., Agricultural Economics, University of Hawaii; M.S., Agricultural Economics, Rutgers University; M.E.M., Environmental Management, Duke University; Ph.D., Agricultural Economics and Economic Development, Virginia Polytechnic Institute and State University.

Principal economist at the World Bank in Washington, D.C., Dr. Sharma is the primary author of the bank's forest policy. His research interests are in applied economics, project design and policy analysis. He has worked in developing countries on policy issues related to conservation and sustainable development, poverty, natural resource management, and policy dialogue. His current research focuses on quantification of environmental impacts and local participation.

**Harold Karl Steen**, Ph.D., *Adjunct Professor*; B.S., Forestry, M.F., Ph.D., History of Conservation, University of Washington.

Dr. Steen's current research interests are the political and economic development of modern forestry concepts and policies, and the history of conservation and land use as related to current forest land issues. He is the former director of the Forest History Society at Duke University.

**Panchabi Vaithianathan**, Ph.D., *Assistant Research Professor*; B.S., M.S., Geology, Ph.D., Environmental Science, Jawaharlal Nehru University.

Dr. Vaithianathan's research activities have focused on understanding the biogeochemical cycling of nutrients and trace metals in aquatic systems. He has carried out laboratory and field research in Indian rivers, Chesapeake Bay estuaries, Canadian shield lakes, and floodplains of the Parana River and the Florida Everglades. His recent work has centered on the impacts of agricultural runoff on the nutrient dynamics in the Everglades. He is a senior scientist at the Duke Wetland Center laboratory in Florida.

**John J. Vandenberg**, Ph.D., *Adjunct Assistant Professor*; B.A., Biology, The College of Wooster; M.S., Ph.D., Biophysical Ecology, Duke University.

Dr. Vandenberg's current research interests are in health risk assessment methodology and application and the evaluation of risk assessment techniques for hazardous air pollutants. He is director of the Research to Improve Health Risks Assessments program in the Office of Research and Development, United States Environmental Protection Agency, Research Triangle Park, NC.

**David N. Wear**, Ph.D., *Adjunct Assistant Professor*; B.A., Botany, University of Montana; M.F., Resource Systems Science, Duke University; Ph.D., Forest Economics, University of Montana.

Dr. Wear's current research concerns the economics of ecosystem management, the design of forestry policies, and the regional assessment of forest production and investment. He is project leader for the economics of forest protection and management with the USDA Forest Service, Southeastern Forest Experiment Station, Research Triangle Park, NC.

**Reiner Zimmerman**, Ph.D., *Adjunct Assistant Professor*; B.S., Botany, M.S., Ecology and Biogeography, Ph.D., Physiological Plant Ecology, University of Bayreuth, Germany.

Dr. Zimmermann is a member of technical staff at the Jet Propulsion Laboratory/California Institute of Technology in Pasadena. His primary research interests are comparative studies of water use by vegetation along a latitudinal gradient from boreal to tropical forest types and the relationships between dielectric properties, tree water status canopy structure, and its detection with synthetic aperture radar.

## Faculty Emeriti

Roger F. Anderson, Ph.D., *Professor Emeritus*  
Cazlyn G. Bookhout, Ph.D., *Professor Emeritus*  
John D. Costlow, Ph.D., *Professor Emeritus*  
George F. Dutrow, Ph.D., *Professor Emeritus*  
John W. Gutknecht, Ph.D., *Professor Emeritus*  
Benjamin A. Jayne, Ph.D., *Professor Emeritus*  
James Granville Osborne, B.S., *Professor Emeritus*  
William R. Sizemore, Ph.D., *Professor Emeritus*  
William J. Stambaugh, Ph.D., *Professor Emeritus*  
James G. Yoho, Ph.D., *Professor Emeritus*





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## *Degrees and Programs of Study*





## Degrees

Duke University offers undergraduate, professional, and research programs in several areas of study related to natural resources and the environment. A Bachelor of Arts degree with a major in environmental sciences and policy or geology is offered through Trinity College of Arts and Sciences. Master of Environmental Management (M.E.M.) and Master of Forestry (M.F.) degrees are offered by the Nicholas School of the Environment; and the Ph.D. degree is offered in the Department of the Environment of the Graduate School. The Master of Arts (A.M.) is available through the Graduate School for individuals wishing to pursue graduate study in the environment in conjunction with a J.D. degree in the School of Law. Students generally are not admitted to the Department of the Environment as candidates for a terminal Master of Science (M.S.) degree; however, the M.S. may be awarded as part of a doctoral program.

**The Distinction between Professional and Graduate Degrees.** The degrees offered through the Nicholas School of the Environment (M.E.M. and M.F.) are *professional* degrees. They are intended mainly to provide students with the broad education and experience necessary for careers in natural resource and environmental management. The professional degrees emphasize applied science, economics, policy, and quantitative methods of problem analysis and decision making.

The Master of Environmental Management degree is designed to develop expertise in planning and administering the management of the natural environment for maximum human benefit with minimum deterioration of ecosystem stability. M.E.M. degree candidates choose one of five programs of study: Coastal Environmental Management; Environmental Toxicology, Chemistry and Risk Assessment; Resource Ecology; Resource Economics and Policy; or Water and Air Resources.

The Master of Forestry degree concentrates on forest and associated resources, including timber, water, biodiversity, and recreation and their management from an ecological and economic point of view. The graduate with an M.F. degree is qualified for employment as a professional forester in an administrative or staff position with federal and state agencies, industries, consulting firms, and other organizations concerned with forest and land management. The Forest Resource Management program is offered under the M.F. degree. This program is accredited by the Society of American Foresters.

Students planning careers primarily in university teaching and research are urged to follow a course of study in the Graduate School. The *graduate* degrees (A.M., M.S., Ph.D.) are appropriate for students desiring to concentrate their study and research within a well-defined subject area. Students usually pursue fewer and more advanced topics to a greater depth than do students in professional degree programs. Graduate School students emphasize research as major parts of their degree programs. An active research program is a vital component of the Nicholas School of the Environment, and most of the research projects in the school utilize Ph.D. candidates as research assistants. The prospective Ph.D. student should consult the *Bulletin of the Graduate School* for more detailed information.

Individually designed programs of study related to natural resources and the environment are possible under either the professional or graduate degrees, with faculty approval.

## Requirements for the Professional Degrees

A total of 48 units is required for either the Master of Environmental Management (M.E.M.) or the Master of Forestry (M.F.) degree. Although a student may fulfill part of the degree requirements through an internship or independent study off campus, he or she must complete at least 36 units and three semesters in residence and pay full tuition for the fourth semester. Transfer credit is not accepted. With advisor approval, students may count up to 6 credits of Duke undergraduate course work at the 100-level with a grade of at least C toward their degree requirements.

Students' programs consist of a combination of regular courses, independent projects, and seminars. A master's project of 4 to 6 units is required of all students. Course work in other departments of the university and at nearby institutions is available to strengthen students' education in special areas.

A full semester load is 12 units, which should ordinarily consist of a combination of regular courses, independent projects, and the master's project. Not more than four regular courses should be taken in a semester. Permission of the student's adviser is required to take more than 15 or fewer than 9 units in a semester.

### ONE-YEAR MASTER OF FORESTRY OPTION

Students who have an undergraduate degree in forestry may earn a Master of Forestry degree with only 30 units of credit. To be admitted to the one-year degree option, the student must have received a Bachelor of Science in Forestry degree from an accredited forestry school. The student must spend a minimum of two semesters in residence.

### SPECIAL DEGREE TRACK FOR PRACTICING PROFESSIONALS

The Nicholas School of the Environment offers a special professional master's degree track, through the Senior Professional Program, that allows a reduced term of residency.

Candidates with at least five years of work experience in an environmental field may be admitted to the Nicholas School of the Environment as part-time students. These professional degree candidates must spend one semester at Duke enrolled in regular, graduate level courses. Up to 15 units of credit are taken during this time. The remaining 15 or more units of credit required for a Master of Forestry or Master of Environmental Management degree may be earned through continuing education intensive courses, independent study, and a master's project. Candidates have five years from the date of acceptance to complete the credit requirements.

Specific degree requirements for students in the Senior Professional Program, including required courses and the number of academic units necessary to complete the degree, are established by the student's advisor upon evaluation of the individual's previous education, work experience, and career goals.

## Concurrent Degrees

Master of Environmental Management and Master of Forestry. Students desiring to earn both the M.E.M. and the M.F. degree can do so by planning their courses appropriately. The requirements for earning both degrees are as follows:

1. The student must qualify for either the M.E.M. or M.F. degree by earning 48 units of credit under the requirements set forth above.
2. For the second degree, the student must complete an additional 24 units of study composed of courses that would normally be accepted toward the second

degree. Two additional semesters in residence are normally required, although, with careful planning, the student may complete both professional degrees in a total of five semesters.

Determination of eligibility for the degrees will be made on an individual basis and will consider the educational background and objectives of the student.

**Master of Business Administration.** The techniques of management science are applied with increasing frequency in the management of natural resources, and they are also now commonly used in the analysis of environmental problems. To integrate training in these management techniques more effectively into the curriculum, the Nicholas School of the Environment has developed a cooperative arrangement with Duke's Fuqua School of Business. Three years of study are required to earn the combined degrees of Master of Environmental Management/Master of Business Administration or Master of Forestry/Master of Business Administration. Normally, at least 36 units of credit within the school are required to receive the M.E.M. or M.F. degree. A typical program sequence would involve spending the first year in the Nicholas School of the Environment followed by a year in the Fuqua School of Business and concluding with the final year of combined work in both schools. There is, however, flexibility in which program the student commences study.

These concurrent degrees stress concepts, analytical reasoning, and the basic methodologies of management science, while providing the student with a knowledge of current problems in the natural resource industries. Managerial economics, resource economics, organization theory and management, accounting, information and control, resource management, the legal environment, and public policy aspects of resource industries form a substantial component of each degree.

Because of the academic demands of these degrees, those entering without the necessary analytical skills or life science background may be required to take additional work beyond that specified.

Students who wish to undertake both the Master of Environmental Management or Master of Forestry and Master of Business Administration degrees must apply to and be accepted by each of the respective schools. For information on the Master of Business Administration degree, the prospective student should write to the Fuqua School of Business, Admissions Office, Duke University, Box 90104, Durham, N. C. 27708-0104.

**Master of Public Policy.** As issues concerning natural resources and the environment have become of increasing significance to the nation, there has developed a corresponding need for well-trained policy analysts who can provide timely and appropriate information and analysis to resource policy makers. To meet this need a unique concurrent degree has been developed in cooperation with the Terry Sanford Institute of Public Policy. Students pursue a Master of Environmental Management or Master of Forestry degree and a Master of Public Policy. Doctoral candidates in forestry and the environmental sciences are also eligible to undertake the Master of Public Policy.

The concurrent degree takes two and one-half years to complete. The first year is typically devoted to study in the Terry Sanford Institute of Public Policy, and the second year and a half is typically spent in the Nicholas School of the Environment. The final semester involves work in the Nicholas School. Normally, at least 36 units of credit within the school are required to receive the M.E.M. or M.F. degree. A summer internship with a resource or environmental agency, or with a related legislative, judicial, or interest group, is required for the policy degree.

This degree provides training in the politics and economics of resource and environmental policy making. Emphasis is placed on understanding the social and political forces involved, developing facility with quantitative and logical methods of



forecasting, and evaluating policy consequences. Knowledge of the uses and limitations of policy analysis and an awareness of the ethical dimensions of policy choice are also stressed.

Students must apply to and be accepted by both the Nicholas School of the Environment and the institute. For detailed information on the public policy degree, write to Director of Graduate Studies, Terry Sanford Institute of Public Policy, Duke University, Box 90240, Durham, N. C. 27708-0240.

**Juris Doctor in Environmental Law.** Environmental and natural resource issues increasingly require legal and regulatory knowledge for resolution. There is a growing demand for resource managers and scientists who have legal credentials; similarly, attorneys are facing more situations in which knowledge of natural resources and the environmental sciences is critical to the resolution of disputes. To satisfy these demands, the Nicholas School of the Environment and the School of Law have developed a cooperative arrangement to allow pursuit of concurrent Master of Environmental Management or Master of Arts and Juris Doctor degrees.

For students in the concurrent M.E.M./J.D. program, the Nicholas School of the Environment requires 36 units of credit. The School of Law requires 72 units of law credit and awards 12 units for work done in the Nicholas School of the Environment.

Typically, a student will complete the first year of study in the School of Law and the second in the Nicholas School of the Environment. During the third and fourth years, the student will take a combination of courses in both schools. M.E.M./J.D. candidates must apply to and be accepted by both the Nicholas School of the Environment and the School of Law.

For students in the concurrent A.M./J.D. degree, 24 units of credit are required in the Department of the Environment of the Graduate School and 72 units in the School of Law. Further information is available from the director of graduate studies.

For information on the law degrees, prospective students should write to the School of Law, Admissions Office, Duke University, Box 90393, Durham, N.C. 27708-0393.

**Joint M.E.M./M.A.T.** Over the last several decades, international concern for protecting our ecosystem has led to an increased understanding of the need to broadly educate citizens on the challenges facing our environment. This increased awareness is demonstrated through the development of numerous education programs aimed at K-12 students as well as to the general population. Environmental education is of increasing importance to those who prepare to teach, particularly in the sciences. Duke's concurrent degree program between the Nicholas School of the Environment and the Graduate School allows students to meet this need by earning a Master of Environmental Management (M.E.M.) and a Master of Arts in Teaching (M.A.T.) degree.

Students must complete 36 units of credit in the Nicholas School of the Environment, including a master's project. For the M.A.T. degree, students will complete 30 units of credit, including the full-year internship.

For the M.A.T. degree, students will complete all requirements for the North Carolina teaching licensure in comprehensive science. Competencies required by the state will be met through undergraduate courses taken prior to admission to Duke, science courses taken as part of the M.A.T., or courses taken as part of the M.E.M.

Students will normally enroll in the M.A.T. program prior to enrolling in the M.E.M. program.

Students must apply to and be accepted by both the Nicholas School of the Environment and the Graduate School of Duke University, citing the Master of Arts in Teaching program. Students admitted to the M.A.T. program in comprehensive science must hold an undergraduate degree in one of the natural sciences with significant undergraduate preparation in biology and chemistry. Organic chemistry is required.



The individual program of study will require additional preparation in the sciences and education in addition to a full-year teaching internship under the direction of a mentor.

Questions concerning the M.A.T. degree should be addressed to the Director of the Master of Arts in Teaching Program, Duke University, Box 90093, Durham, N.C. 27708-0093; telephone (919) 684-4353.

**Other Concurrent Degrees.** With the special permission of the education committee and the dean of the Nicholas School of the Environment, students are permitted, on an individual basis, to establish concurrent degree programs with certified graduate degree programs either within or outside of Duke University. In the past, students have designed such programs with law schools, business schools, and graduate engineering programs. As with the other concurrent degrees, the student must be enrolled in the Master of Environmental Management or Master of Forestry degree program for 36 units of credit and in residence for at least one full year.

To gain acceptance of a specially designed concurrent degree, the student must show an official acceptance from another certified graduate degree program. In order to receive the M.E.M. or M.F. degree, the student must have completed 36 units of credit, the master's project, all program area requirements, and at least one full year of study in the other degree program (with an official transcript of work completed). For additional information concerning special concurrent degrees, applicants should consult the Office of Enrollment Services.

## Graduate Degrees

The Doctor of Philosophy (Ph.D.) degree in disciplines related to earth (geology), environmental and marine sciences is administered by the Graduate School of the university; however, the bulk of the instruction, research, and advising connected with it takes place in the Nicholas School of the Environment. Policy and procedures for admission, general requirements for degrees, registration, and academic regulations are given in detail in the bulletin of the Graduate School and are not repeated here.

**Qualification of Students.** Students seeking admission to the Graduate School must have received an A.B. or B.S. degree (or the equivalent in the case of foreign students) from an accredited institution. Usually the student should have majored in the area of intended graduate study or one closely related to it. Because research is such an integral part of graduate education and of the school's mission, the student's undergraduate record must evidence the capability and motivation to carry out independent study and research at an advanced level.

**Admission.** Applications for Ph.D. and other Graduate School degree programs should be obtained from and returned to the Dean of the Graduate School, Duke University, Box 90063, Durham, N. C. 27708-0063. However, it is important to emphasize that an individual faculty member must accept responsibility for advising an applicant before admission can be offered. Therefore individuals considering application are encouraged to send inquiries about specific programs of study and research to the appropriate area of the Nicholas School in which their potential advisor resides. The brief summaries of individual faculty research interests at the beginning of this bulletin should help you decide about which area you should make your inquiry to. Direct contact with individual faculty is also encouraged. To facilitate this, each faculty member's e-mail address is provided at the end of their statement of research interests.

Inquiries about programs and research in earth and ocean sciences should be sent to the Director of Graduate Studies, Division of Earth and Ocean Sciences, Nicholas School of the Environment, Box 90227, Duke University, Durham, NC 27708-0227 (E-mail: boudreau@geo.duke.edu).



Inquiries about programs and research in environmental natural and social science on the Durham campus should be sent to the Director of Graduate Studies, Nicholas School of the Environment, Box 90328, Duke University, Durham, NC 27708-0328 (E-mail: [nettletto@duke.edu](mailto:nettletto@duke.edu)).

Inquiries about programs and research in environmental natural and social science at the Marine Laboratory in Beaufort should be sent to the Director of Graduate Studies, Nicholas School of the Environment, Duke Marine Laboratory, 135 Duke Marine Lab Road, Beaufort, NC 28516-9721 (E-mail: [ritt@mail.duke.edu](mailto:ritt@mail.duke.edu)).

Upon request, any of the three above contact points can arrange to have application materials sent to the applicant. Information about the Nicholas School of the Environment, its various degree programs and the faculty research interests can also be found at the following three World Wide Web addresses: [www.env.duke.edu](http://www.env.duke.edu), [www.geo.duke.edu](http://www.geo.duke.edu) and [www.env.duke.edu/marinelab/marine.html](http://www.env.duke.edu/marinelab/marine.html). Applicants should refer to the current *Bulletin of Duke University Graduate School* for the requirements for the various degrees offered by the Graduate School.

The priority application deadline is December 31. However, applicants are encouraged to apply by December 1, if possible. Applications postmarked after this deadline will not be considered until all on-time applications have been processed. Applications received by December 1 require a \$65 application fee, as opposed to \$75 for those received after that date.

## Undergraduate Degree in Environmental Sciences and Policy

A Bachelor of Arts degree with a major in environmental sciences and policy is available to Duke undergraduates interested in the interdisciplinary study of environmental issues. The major permits students to combine studies in the natural sciences and engineering with courses in the social sciences and humanities around general focus areas and themes. The major is specifically designed for students with career objectives such as environmental law, policy, management or planning that require an understanding of environmental issues that cross traditional disciplinary boundaries. Courses for the major are taught by more than sixty Duke professors in nineteen cooperating departments and schools.

Students interested in the Environmental Sciences and Policy Program should consult the *Duke University Bulletin of Undergraduate Instruction*, available from the Office of Undergraduate Admissions, for further information. The program is administered through Trinity College of Arts and Sciences; a member of the Nicholas School of the Environment faculty serves as director.

## Undergraduate Degree in Geology

A Bachelor of Arts degree with a major in geology is available to Duke undergraduates interested in all branches of the earth sciences including coastal geology, environmental geology, hydrology, geochemistry, geomorphology, geophysics, paleontology, petrology, sedimentology, and marine geology. The degree requirements emphasize a broad knowledge of both geology and the associated physical sciences. An option is available for one semester of study at the Duke University Marine Laboratory in Beaufort, N.C., to fulfill elective requirements for the degree.

Students interested in the Geology Program should consult the *Duke University Bulletin of Undergraduate Instruction*, available from the Office of Undergraduate Admissions, for further information. The program is administered through Trinity College of Arts and Sciences; a member of the Nicholas School of the Environment faculty serves as director.







## Nondegree, Special Status

Persons interested in pursuing graduate or professional studies in natural resources not leading to a degree may apply for nondegree, special status. Such students may take from 3 to 12 units of course work each semester; they are registered with the university as a student with appropriate privileges and they receive transcripts of work completed for each semester in residence. If the student later applies for admission into a regular degree program, some of the courses may count toward the degree. Students wishing to study for only one or two semesters or to do postdoctoral work should apply for nondegree, special status. Additional requirements are contained in a later section on admissions.

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## *Academic Regulations*



## Planning

The responsibility for the specific content of the academic plan of study rests with the student. A thorough familiarity with and understanding of the regulations contained in this bulletin as well as other sources provided by the school are essential to sound planning.

During the fall term each student is assigned a permanent faculty adviser. The adviser should be consulted in planning a course of study. Other members of the faculty, particularly those concerned with the plan of study, should also be consulted on an informal basis. Reassignment to another adviser can be obtained, but only when approved by the assigned adviser and the prospective adviser.

## Registration

Entering students who register for the Master of Environmental Management or Master of Forestry degree will receive instructions by mail from the Nicholas School of the Environment a few weeks before the start of the fall term. Registration should be completed during the orientation week. Students in residence register for succeeding semesters at times scheduled in the university calendar.

Registration is approved by the adviser and completed by the student using a telephone registration system. Registration is required in order to take courses for credit or audit. To establish eligibility for university and other loans, for the student health service, and for study and laboratory space, a student must be registered. All tuition and fee payments and any indebtedness must be settled before registration will be completed.

**Late Registration.** All students should register at the times specified by the university. The charge for late registration is \$25.

**Change of Registration.** With approval of the adviser, the student can change registration for a period of ten days at the beginning of each semester.

**Refunds.** Tuition refunds are governed by the policy stated in the chapter on financial information.

**Graduate School Registration.** Students in Ph.D. degree programs initiate registration through the director of graduate studies of the Nicholas School of the Environment and complete it through the telephone registration system. Registration requirements and procedures are described in the *Bulletin of the Graduate School*.

**Reciprocal Agreements.** Students enrolled full-time in the Nicholas School of the Environment or in the Graduate School during the regular academic year may enroll for six hours of credit per semester at the University of North Carolina in Chapel Hill, North Carolina State University in Raleigh, or North Carolina Central University in Durham provided that they are also registered for at least six hours of credit at Duke during the same semester. Similarly, graduate students in these schools may take up to six hours per semester at Duke. A student enrolled for two or more courses during a summer at Duke may take one of the courses at one of the neighboring institutions under the reciprocal agreement. This agreement does not apply to contract programs such as the American Dance Festival. The student must pay any special fees required of students at the host institution and provide his or her own transportation.

## Immunization Requirement

The North Carolina immunization law requires students entering a college or university in the state to be immunized against the following diseases: measles, rubella, tetanus, diphtheria and, in some cases, polio. Each entering student is required to present proof of these immunizations in accordance with the instructions contained in the Student Health Services form provided with the student's matriculation material. This form should be completed and returned to Student Health Services prior to the student's first day of classes. Duke University cannot permit a student to attend classes unless the required immunizations have been obtained.

## Courses

**Course Descriptions.** Courses offered by the school are described in the final section of this bulletin. However, courses are subject to change. A list of courses to be offered during a particular term, as well as schedules of courses offered in other departments at Duke and at neighboring universities, are available from the Office of Enrollment Services prior to registration for that term.

**Independent Study.** All students are expected to place increasing emphasis on independent study as they near completion of residence. Independent study can involve many different topics and students register to take independent study credit under Environment 299. Several students can work together under the supervision of a faculty member by registering for Environment 200.

**Master's Project.** All students must complete a master's project of 4 to 6 credits. The project should be identified during the first term of study and initiated during the second and third terms. No student will be permitted to register for the fourth term of study until a project proposal has been approved by the student's adviser and has been received by the school's enrollment services office. During the final two terms major emphasis should be placed on the project. In completing the project, the student applies theoretical and analytical training acquired during the two years of study on actual natural resource or environmental problems. If desirable, arrangements can be made by the student or the school for consultation with other organizations concerning the scope and objectives of the project.

Students maintain close contact with their advisers during the development and writing of the master's project. Projects should reach final stages of completion by mid-term of the final semester in residence. *A final draft of the project must be delivered to the adviser prior to 1 November for those graduating in December, prior to 1 April for those graduating in May, and prior to 1 August for those graduating in September.* The adviser is responsible for critical assessment and grading.



**Auditing.** Students registered for a full course load may audit courses free of charge. Otherwise, the audit fee is \$750 per course. Written permission of the instructor prior to registration for the course is required. Audited courses must be so indicated. In classes where enrollment is limited, students enrolled for credit will receive priority. Audited courses are recorded without grade on the student's permanent record. Regular attendance is expected. Changes from audit to credit are not permitted after the drop/add period.

**Drop/Add.** The period for dropping and adding courses ends on the tenth calendar day of the fall and spring semesters. During the summer, dropping or adding of courses is limited to the first three days of the term. Students are advised to make all class changes on the first day of class if at all possible.

**Intensive Courses.** For the special intensive courses, students may register during the semester two weeks prior to the first day of the course. Students may not register for more than two intensives in a semester without permission of their adviser and the intensive course coordinator. Students who wish to drop an intensive must do so prior to the first day of the course.

**Retaking Courses.** Courses required as a part of the program elected by the student or required by the adviser must be retaken if failed. Courses prerequisite to more advanced courses the student wishes to elect must be retaken if failed. Elective courses may be retaken if the student wishes to do so. See the section on grades, below, for additional information.

## Credit Hours

Candidates for the professional degrees are considered fully registered when they enroll full-time for the number of semesters required in their individual degree programs. The normal registration to reach the required minimum units of credit is 12 units per semester, although a variation from 9 to 15 units is common. Students must have the permission of their adviser to register for more than 15 units in a semester, and all students who wish to enroll for fewer than 9 units must make a formal request to the education committee to study part-time.

**Summer Registration.** Professional degree candidates are normally not required to register for summer courses. However, a student who wants to supplement his or her graduate work with courses during the summer may do so through the Duke University telephone registration system. The cost is at the part-time rate per unit, and a summer health fee is assessed for students studying on campus. Summer registration does not affect the number of units, semesters in residence, or flat-fee tuition for the regular academic year.

## Grades

The grading system used in the Nicholas School of the Environment and the Graduate School is as follows: *E* (exceptional); *G* (good); *S* (satisfactory); *F* (failing); *I* (incomplete); *Z* (continuing).

The grades of *P* (pass) and *F* (fail) are used in the Nicholas School of the Environment for seminars, master's projects, program area seminars and modular courses. At the instructor's option, the grades of *P* or *F* or regular letter grades are used for intensive courses and independent projects. The grade of *Z* is assigned for an independent project or a master's project which extends over a period of more than one semester; a final grade is given upon completion of the project. Credit hours for a course completed on a pass/fail basis are creditable toward the master's degree as long as the course is not required in the student's major area of study. Permission for the pass/fail option must be obtained in writing from the instructor upon registration for a course.

**Incomplete Grades.** A grade of *I* indicates that some portion of the student's work is lacking, for an acceptable reason, at the time grades are reported. Requirements of all

courses in which a grade of Incomplete is assigned by an instructor must be fulfilled within one calendar year following the date of the assignment of the incomplete grade.

In exceptional circumstances, upon recommendation of the professor who assigned the grade of Incomplete, the dean of the Nicholas School of the Environment may extend the time for completion of the course requirements. If, in the judgment of the professor and the student's adviser, completion of the requirements is not a reasonable alternative for the student, the student may petition the education committee to allow the grade of *I* to stand permanently on his or her record. No student will be allowed to graduate with an Incomplete unless permission has been granted for it to stand permanently on the record.

**Failure.** Any course for which a failing grade is received must be retaken or replaced with a substitute course. A substitute course requires the approval of the student's adviser and the education committee. Both the original failing grade and the grade received for the retaken or substitute course will appear on the student's transcript. Failure of a course also subjects the student to dismissal (see the sections on probation and dismissal and automatic dismissal).

**Probation and Dismissal.** Students are subject to dismissal from the school under any one or a combination of the following factors:

1. no grades higher than *S* during the first semester of study;
2. less than 6 units of *G* and/or *E* grades during the first full year of study;
3. a grade of *F* in any course at any time.

An appeal may be submitted through the adviser to the education committee to continue study under a probationary status. Probationary terms, set by the adviser, must be specific in the appeal and the appeal must be approved by the education committee. If probationary terms are met, the student will be returned to regular status. If probationary terms are not met, the student will be dismissed. Students will not be awarded degrees while on probationary status.

**Automatic Dismissal.** A student is automatically dismissed upon failure of more than one course.

## Honor Code

The Nicholas School of the Environment advocates the highest standard of professional ethics and academic integrity. Students and faculty have developed an honor code for the school which is distributed to all students prior to matriculation and discussed during orientation.

## Academic Irregularities

All cases falling outside the regular policies and procedures of the school are referred to the education committee for decision. The work of the committee includes review and decision regarding course requirements for graduation, student probation and withdrawal, student petitions for waivers of degree requirements, and all actions which deviate from established academic regulations.

A student who desires to petition the committee should do so by writing to the chairman. A precise statement of the reason for the request is required. The student will be notified in writing of the decision of the committee by the chairman.

## Transcripts of Credit

A student who is registered for a course and who successfully completes the requirements as prescribed by the instructor receives credit on university records. A transcript fee, charged to all students during their first semester in residence, covers all future transcript requests. Transcripts of credit are issued only by the university Registrar, 103 Allen Building. Requests for transcripts, sent directly to the registrar,

should state clearly the full name under which the work was taken, the dates of attendance, and to whom the transcripts are to be sent. The student must sign the request for release of a transcript. No transcripts will be issued for students who fail to clear all financial obligations to the university upon graduation.

## **Length of Study**

For a full-time student, the normal time for completing a professional master's degree is four semesters. Exceptions may be made for students who have an undergraduate degree in forestry and for students enrolled in the Senior Professional Program. No student, either full-time or part-time, is allowed more than five years to complete the requirements for the master's degree.

## **Leave of Absence or Withdrawal**

Occasionally, special circumstances require a student to leave the university for one or two semesters at a time. If the reason for the departure is considered an emergency, the student may request a leave of absence for a period not to exceed one year. If the reason is to study elsewhere in a combined degree program, a leave will be granted for the length of study. If the student plans to do field studies or an internship, he or she must maintain university enrollment by paying a registration fee each semester of the academic year until full-time study is resumed.

Under all circumstances, the student must request the leave for a specific length of time prior to departure from the university. Extensions must be requested if they are required. Failure to request a leave or an extension of leave may result in a penalty charge and/or dismissal from the university. A student is eligible to request a leave of absence only after having completed at least one semester of study.

A student who wishes to withdraw must make a written request to do so. For refunds upon withdrawal, see the chapter on financial information.

## **Application for the Degree**

Even if degree plans are tentative, a candidate for a degree must file an application for the degree no later than the end of the sixth week of the semester in which the degree is to be received. For a degree to be awarded in September, application must be filed no later than the beginning of the second summer session. The application for the degree is valid only for the semester in which it is filed. If the student does not receive the degree as expected, he or she must file a new application.

## **Graduation**

All candidates are urged to attend the commencement exercises at which their degrees are to be awarded. A student who is unable to attend is required to file a petition with the dean, not later than four weeks prior to commencement, seeking permission to receive the degree in absentia.

## **Debts**

Students are expected to meet all financial obligations to the university prior to completion of the degree. Failure to pay all university charges by the due dates specified by the university will bar the student from registration, class attendance, receipt of transcripts, certification of credits, leave of absence, or graduation until the account is settled in full. Further, an individual in default may be subject to withdrawal from the university.



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## *Professional Programs*



In the Nicholas School of the Environment, emphasis is placed on maintaining the highest standards of scholarship and on relevance to contemporary needs in natural resources study and research.

The school emphasizes three broad conceptual areas in its instruction and research: natural resource and environmental science, resource economics and policy, and quantitative methods of analysis and decision making. Regular courses, intensive courses, seminars, and special studies are offered in each of the three areas. Preparation for professional employment requires a higher degree of specialization than is characterized by this framework, however. Hence, six programs of study have been designed by the faculty to assure professional competence in some aspect of natural resources while offering adequate breadth of educational experience. One of these programs, Forest Resource Management, is offered under the Master of Forestry degree. The remaining five: Coastal Environmental Management; Environmental Toxicology, Chemistry, and Risk Assessment; Resource Ecology; Resource Economics and Policy; and Water and Air Resources are offered under the Master of Environmental Management degree.

Ph.D. candidates may also use these programs as a foundation for their course work.

Qualified students who have interests outside of the structured programs are permitted to design individual programs of study. Pursuit of an individual program requires preparation of a comprehensive statement of objectives and specification of each of the program components: major courses, quantitative courses, seminars, electives, and a master's project. All individual programs of study are subject to approval by the education committee. Students who wish to pursue an individual program of study must request approval of their program by the end of their second semester of enrollment.

## Program Requirements

Each of the school's professional programs requires the completion of 48 units of credit. These units are distributed among a set of core courses constituting the major, quantitative courses, electives, a master's project, and seminars relevant to the program's objectives. These broad categories are discussed briefly below, and major (core) courses are listed for each program. More specific information about requirements for any one of the programs can be obtained from the Office of Enrollment Services.

**Major (Core) Courses.** Each program requires a series of core courses in the major area of study. These courses are specified or, in some cases, elective within the limits of the program emphasis.

**Quantitative and Analytical Courses.** All programs require 6 to 12 units in quantitative and analytical methods related to natural resource analysis, modeling, and management.

**Elective Courses.** Elective courses are available to give the student flexibility in developing his or her course of study. These credits are used to add depth to the major area of study or to develop a second area of expertise. Students who select the Resource Economics and Policy program and who have not had previous training in a natural resource area must use at least three of their elective courses to meet this requirement.

**Master's Project.** A master's project constituting 4 to 6 units of credit is required. These projects take the form of individual or small group research efforts related to some area of natural resource management.

Seminars. All students are required to participate in seminars in their program area for 1 unit of credit. During their last semester in residence, students present the results of their master's project in a school-wide symposium.

## Coastal Environmental Management

The Coastal Environmental Management program provides a scientifically rigorous understanding of global, national, and local physical and biological coastal environments and processes and the human behaviors and policies that affect, and are affected by, those environments and processes. The specific aim of the program is to train scientifically informed professionals to fill coastal policy and management, research, or advocacy positions in federal and state agencies, industry, consulting firms, and nonprofit organizations. The program also provides a firm foundation for future Ph.D. studies.

The first year of the program is usually spent on the Durham campus fulfilling the required courses in areas such as natural resource economics, general environmental policy, ecology, and methodological skills. The second year is usually spent in residence at the Marine Laboratory in Beaufort taking courses in the natural, social and policy sciences specific to the coastal and marine environment, and focusing on the production of the master's project. The Marine Laboratory provides an ideal setting for the study of natural and social scientific phenomena in the coastal and marine environment, and for interaction with coastal and marine constituencies and policy makers in the application of science to policy. Potentials for participation in the policy-making process are emphasized throughout the program.

The Coastal Environmental Management program is offered under the Master of Environmental Management degree. The program provides an educational background in ocean science and coastal ecosystems and in natural resource and environmental policy as it applies to coastal and marine issues. Students may use electives and additional course work to accommodate a second emphasis in one of the other program concentrations offered within the school.

**Core Courses.** ENV 276 Marine Policy; ENV 270L Resource and Environmental Economics; one additional policy course; one ecology course; and two ocean science courses.

## Environmental Toxicology, Chemistry, and Risk Assessment

The Environmental Toxicology, Chemistry, and Risk Assessment program (ETCRA) is concerned with the transport and fate, effects, and risks of pollutants to natural ecosystems and human users of those systems, as well as linkages between ecological and human health. ETCRA is a multidisciplinary program incorporating the concepts, information bases, and methodologies of ecology, toxicology, environmental chemistry, and risk assessment. The goal of the program is to produce scientists and environmental managers with a solid foundation in the principles underlying pollutant fates and impacts, as well as a firm grasp of state-of-the-art approaches for evaluating specific instances of environmental contamination and for making management decisions based upon quantitative analysis.

Duke offers exceptional opportunities for training in environmental toxicology, chemistry, and risk assessment. Environmental toxicology is a key component of the university-wide Integrated Toxicology Program. Additionally, the ETCRA curriculum is enhanced by resources of sister universities in the Research Triangle area (particularly the University of North Carolina at Chapel Hill and North Carolina State University) and institutions within the Research Triangle Park, such as the Environmental Protection Agency, the National Institutes of Environmental Health Sciences, and the Chemical Industries Institute of Toxicology.

Environmental toxicology, chemistry, and risk assessment is offered under the Master of Environmental Management degree. Students in the program are required to



take a common core of courses that includes environmental toxicology and chemistry, ecology, environmental economics and policy, and statistics and risk assessment. Additionally, students are encouraged to develop a concentration in one of three specializations: environmental toxicology, environmental chemistry, or environmental risk assessment.

**Core Courses.** ENV 212. Environmental Toxicology; ENV 240. Fate of Organic Chemicals in the Aquatic Environment or ENV 242. Environmental Aquatic Chemistry; ENV 385. Decision Theory and Risk Analysis or a new course, Human and Ecological Risk Assessment; one graduate course in ecology; and one course in environmental economics, policy, or law.

## Forest Resource Management

The Forest Resource Management program integrates biological and physical components of forest ecosystem management within an educational program that strongly emphasizes related environmental fields. The program builds knowledge in basic forest ecology and integrates this knowledge with foundations in a wide range of forest resources, including environmental quality. This distinctive approach is brought about by coordination of resource inventory course work; resource oriented courses such as soils, hydrology, silviculture, and tree physiology; management oriented courses that include modeling and ecosystem analysis; and courses in resource economics and policy. The Duke Forest is used as an outdoor laboratory in many courses.

The program emphasizes the use of computer based, quantitative techniques to facilitate ecosystem management. Various methods of analysis are applied to forest resources in order to optimize production within the context of biological, physical, and economic conditions.

The focus of the Forest Resource Management program is problem solving in complex ecologic and management systems. Within the program, students have the flexibility to gain depth in an area of specialization. Consequently, students may acquire skills that qualify them for positions in forest products industries, conservation organizations, government agencies, nonprofit organizations, and other groups concerned with the use and conservation of forests. The program can provide an excellent foundation for the Ph.D. and a career in research. Students who complete this program and also complete a Master of Business Administration degree in the Fuqua School of Business have particularly strong credentials for employment in private industry.

Forest Resource Management is offered under the Master of Forestry degree. Students may use electives and additional course work to accommodate a second emphasis in another program area within the school.

This program is accredited by the Society of American Foresters, which is recognized by the Council on Postsecondary Accreditation and the Department of Education as the accrediting body for forestry in the United States.

**Core Courses.** ENV 201. Forest Resources Field Skills; ENV 204. Forest Inventory, Growth and Yield; ENV 205L. Ecological Management of Forest Systems (Silviculture); ENV 213. Forest Ecosystems; ENV 270L. Resource and Environmental Economics; ENV 316. Case Studies in Environmental and Forest Management; plus one additional course in each of three broad categories—principles, practices, and management.

## Resource Ecology

The Resource Ecology program is concerned with the application of ecological theory to the management of terrestrial and aquatic resources and ecosystems. An integrated management scheme is advocated; that is, one which takes into account natural science as well as economics, ethics, and politics.

The framework for the development of management guidelines is provided by these general ecological mandates: the recognition of a hierarchical order of study (organism, population, community, and ecosystem); the understanding of connections among ecosystems and ecosystem processes; and the maintenance of ecosystem functions for future generations.

The applied thrust of the program allows the student to evaluate as well as to solve environmental management problems. Problem solving is based on the best possible scientific description and interpretation of ecological processes and analysis of appropriate data bases. Applied ecology recognizes the needs of environmental managers and provides an organizing framework for information to help minimize resource use conflicts.

A strong background in quantitative methods is required of students in this program, as it is for other programs offered by the school. Mathematical and conceptual models are invaluable in clarifying environmental problems. They are essential to describe basic biophysical and biogeochemical processes, to test hypotheses, and to predict and interpret the response of ecosystems to management and disturbance.

The specific objective of the Resource Ecology program is to train professionals for management or research positions with state or federal natural resource agencies, regional planning bodies, resource management companies, and consulting firms. Graduates of the program have practical experience with the analysis of ecological problems such as species conservation, flooding, disturbance of wetlands, integrated pest management, soil conservation, and mining reclamation.

Resource ecology is offered under the Master of Environmental Management degree. Majors in the program select an area of concentration. Examples include aquatic/wetlands ecology, conservation biology, forest ecology, landscape ecology, or quantitative ecology. Students may use electives and additional course work to accommodate a second emphasis in another program area within the school.

**Core Courses.** Ecology courses are required at the ecosystem/community, population, and organismal levels of biological organization; ENV 270L. Resource and Environmental Economics; ENV 316. Case Studies in Environmental and Forest Management.

## Resource Economics and Policy

Society long has had laws and institutions aimed at regulating the use of natural resources such as forests, wetlands, wildlife, water, and minerals. During the past few decades, new institutions have been developed to deal with problems of water and air pollution, toxic substances, and related areas of environmental degradation. These institutions demand a professional who has the necessary expertise to staff both public and private decision-making bodies.

The Resource Economics and Policy program is designed to train decision makers and those who advise them. The program emphasizes the basic methods needed by the professional for analyzing existing policy and for testing the possible outcome of new environmental and resource policy being considered by public and private agencies. The program is highly analytical and is oriented toward the analysis of contemporary national and international environmental problems.

Decision making in natural resource and environmental policy requires mastery of three broad areas of knowledge: the basic sciences pertaining to a natural resource or an environmental phenomenon; the relevant disciplines in the social sciences; and the quantitative methods required for using knowledge from the physical, biological, and social sciences to arrive at a decision.

Courses relevant to renewable and nonrenewable natural resources may be part of the student's educational background or may be planned as part of the master's degree. For the natural resource decision maker, the most important social sciences are resource and environmental economics, political science, and legal analysis. Economics includes

environmental economics, the economics of public goods and externalities, public finance, and the intertemporal allocation of natural resources. Political science includes the behavior of administrative agencies, regulatory agencies, and legislative bodies. Legal analysis emphasizes the allocation of resources as reflected in property rights and environmental risks as reflected in torts. Quantitative methods, an essential component of this program, include statistical inference, methods of optimization, and benefit-cost analysis.

Resource economics and policy is offered under the Master of Environmental Management degree. Students may use electives and additional course work to accommodate a second emphasis in another program area within the school. Specializations are also available in international environmental policy, and marine and coastal zone management policy.

**Core Courses.** ENV 270L. Resource and Environmental Economics; ENV 274. Resource and Environmental Policy; and one of the following: LAW 327. Environmental Law or ENV 299.10 Resource and Environmental Law.

**Doctoral Program.** Students accepted for a doctoral program in resource economics and policy must have significant previous training in economics or another social science. Doctoral candidates in resource and environmental economics must take substantial course work in Duke's Department of Economics and pass the department's preliminary examinations in economic theory. Doctoral candidates in resource and environmental policy must take substantial course work in political science, public policy or political economy in relevant departments at Duke or cooperating universities.

## Water and Air Resources

The program in Water and Air Resources enables students to obtain a scientific understanding of the basic physical and chemical processes affecting these natural resources and trains students to apply this understanding, together with quantitative, analytical and statistical techniques, to the management of these resources. Emphasis is placed on understanding the following: effects of land resource management on water quality; water quantity and transport; water and atmospheric chemistry; and air pollution.

Course work and other training in the program cover basic physical and chemical processes relevant to hydrologic and atmospheric sciences, methods of quantitative and statistical analysis, and methods of management and decision making. The basic processes emphasized are those concerned with watershed hydrology; stream and lake water quality; water and atmospheric chemistry; general meteorology and climatology; and the origins, transport, and fate of aquatic and atmospheric pollutants. Quantitative analysis techniques include statistical and numerical methods, probabilistic and deterministic models, and optimization and simulation methods. These courses are integrated with others in water and air resource management, and economic analysis.

Graduates of the program have the skills to become analysts or consultants for private industry and public agencies concerned with understanding the management and protection of water and air resources. These employers include government agencies, public utilities, consulting firms, and hydrologic, atmospheric, or environmental research centers.

Water and Air Resources is offered under the Master of Environmental Management degree. Majors in the program can select an area of concentration: water resources, air resources, or a combination of water and air resources. Students may use electives and additional course work to accommodate a second emphasis in another program area within the school.

**Core Courses.** At least one course from among those approved in each of four areas: physical sciences, chemical sciences, biological or ecological sciences, and social sciences; plus three additional courses in the area of concentration.



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*Admissions*



## Professional Versus Graduate Admissions

The student contemplating postbaccalaureate study at Duke in natural resources and the environment or geology enters either the Nicholas School of the Environment or the Graduate School depending on the choice of degrees. The professional degrees, consisting of the Master of Environmental Management (M.E.M.) and Master of Forestry (M.F.), are administered by the Nicholas School of the Environment. Students wishing to earn either of these professional degrees should apply directly to the school. Those wishing to earn a Doctor of Philosophy (Ph.D.) or Master of Arts (A.M.) degree should apply to the Graduate School. This chapter describes application to Nicholas School of the Environment professional degree programs.

## Admission to the Nicholas School of the Environment

The Nicholas School of the Environment welcomes applications from men and women of all backgrounds who seek an intellectually challenging education designed to prepare them for leadership in a wide variety of natural resource and environmental careers. Admission is open to men and women who hold a bachelor's degree from an accredited college or university or who have completed at least three years of study in an institution participating in the Cooperative College Program. Admission as a special or nondegree student may also be granted under appropriate circumstances.

Prerequisites. All students admitted to the school are expected to have had the following:

1. Some previous training in the natural sciences or the social sciences related to their area of interest in natural resources;
2. At least one introductory course in calculus;
3. A statistics course that includes descriptive statistics, probability distributions, hypothesis testing, confidence intervals, correlation, simple linear regression, and simple ANOVAs;
4. A working knowledge of microcomputers for word processing and data analysis.

Each program requires additional courses or recommends additional preparation, as follows:

- Coastal Environmental Management: microeconomics;
- Environmental Toxicology, Chemistry, and Risk Assessment: significant undergraduate education in biology and chemistry, with a course in organic chemistry required;
- Forest Resource Management: microeconomics, introductory ecology;
- Resource Ecology: microeconomics; introductory ecology;
- Resource Economics and Policy: microeconomics;
- Water and Air Resources: microeconomics; undergraduate training in chemistry recommended.

Although students without the level of preparation described above may be accepted for admission, it is expected that deficiencies will be made up prior to entrance by means of formal course work or other arrangements agreed upon by the applicant and the school. A limited number of deficiencies may be made up during the first year of residence; however, these courses will not count toward the 48 units of credit required for the M.E.M. or M.F. degree.

**Admission Criteria.** Admission to the Nicholas School of the Environment is highly selective. Academic performance as an undergraduate, scores on the Graduate Record Examination, and work experience are the primary factors considered in the application review process. Recommendations, the statement of educational goals, extracurricular activities, and other information requested on the application also provide a basis for selection.

The admissions committee considers each applicant as an individual. It attempts to evaluate each candidate for his or her academic potential, professional promise, and ability to benefit from and contribute to the goals of the school. Individuals with prior work experience are encouraged to apply since work experience strengthens an application.

**Application Procedures.** Application for admission to the Master of Environmental Management and the Master of Forestry degrees is made through the Office of Enrollment Services of the Nicholas School of the Environment. All correspondence should be addressed as follows: Office of Enrollment Services, Nicholas School of the Environment, Duke University, Box 90330, Durham, N.C. 27708-0330.

Students are admitted at the beginning of the fall term, and spring term, provided that space is available. The application deadline is February 1 preceding the fall in which admission is desired. Because the school processes applications from more qualified students than it can admit, early submission of applications is recommended and no guarantee is made that applications received after the February 1 priority deadline will be considered.

Students who, because of unusual circumstances, wish to begin their studies in January should complete their application no later than October 15 prior to their matriculation.

Each applicant must submit the following before action can be taken. It is preferable that all materials be submitted together.

1. application form;
2. two copies of transcripts from each undergraduate and graduate school attended;
3. three letters of recommendation;
4. scores on the general (verbal, quantitative, and analytical) test of the Graduate Record Examination, taken within the last five years;
5. financial aid form;
6. a nonrefundable application fee of \$65 prior to January 1 and \$75 after January 1.
7. certificate of financial responsibility and TOEFL scores, if the applicant is an international student;
8. undergraduate dean's approval for students applying through the Cooperative College Program.

**Application Forms.** No applicant will be considered until the completed application form and all related documents are received by the Office of Enrollment Services. The admissions committee attaches considerable weight to the statement of educational objectives submitted by the applicant. This statement should reflect well-defined motivation to pursue graduate study. The school is particularly interested in applicants who show leadership potential in the broad field of natural resources and



the environment. Applicants are expected to demonstrate the maturity and sense of purpose essential to a demanding educational experience, including a concept of the value of professional education to the applicant's career plans and expectations.

**Transcripts.** Two copies of official transcripts of all undergraduate and graduate study should be sent to the Office of Enrollment Services in the application package in sealed envelopes that have been signed across the flap by the registrar of the institution attended.

**Letters of Recommendation.** Each applicant is required to submit three letters of recommendation, preferably on the form supplied with the application. These letters should be sent in the application package in sealed envelopes that have been signed across the flap by the writer. These recommendations provide the admissions committee with evaluations of the applicant's past performance in academic and employment related situations. Although recommendations from any source are acceptable, it is preferable that as many as possible come from college instructors.

**Graduate Record Examinations.** All applicants for degree programs must take the general test (verbal, quantitative, and analytical) of the Graduate Record Examination (GRE). Subject tests are not required. For scores to be considered, the GRE must have been taken within five years of the date of application. The GRE is administered by the Educational Testing Service at locations throughout the world. Applicants are urged to take the exam at the earliest convenient date. Scores on tests taken later than December may not reach the school until after the February 1 priority deadline. Scores should be reported to Duke University code number 5156. Registration forms may be obtained by writing to GRE, Educational Testing Service, Princeton, N.J. 08540. Applicants are requested to send copies of their reports to the enrollment services office but official reports from the Educational Testing Service are required before admission decisions can be made.

**Financial Aid Form.** All applicants are expected to complete the financial aid form supplied with the admissions packet. Part 1 of this form indicates whether the applicant is requesting financial aid; part 2 indicates the student's financial need if aid is requested. The application for financial aid has no bearing on admission decisions. Academic criteria are the only standards used to determine admission into the professional or graduate degree programs.

**Application Fee.** A nonrefundable application fee of \$65 prior to January 1 and \$75 after January 1 is required of all applicants. A personal check, money order, or cashier's check made payable to Duke University is acceptable. Applications will not be officially received or processed until the required fee has been paid.

**Additional Procedures for International Students.** Each year the Nicholas School of the Environment welcomes a number of international students among its professional and graduate candidates. Applicants from other countries must meet the same criteria as applicants from the United States. All academic transcripts and other documents in support of admission must be accompanied by an official translation if the original document is not in English. The nonrefundable application fee of \$65 must accompany the application. Applicants must have a fluent command of oral and written English. No allowance is made for language difficulty in arranging course schedules or in evaluating performance.

If the native language is not English, the applicant must submit scores on the Test of English as a Foreign Language (TOEFL) to be considered for admission. All arrangements for taking the TOEFL must be made directly with the Educational Testing Service, Box 6151, Princeton, N. J. 08540-6151; telephone 609-771-7100. In cases where an applicant's TOEFL score is low, the applicant may be accepted on the provision that he/she complete an intensive English language program.

All foreign Graduate School students whose native language is not English will be tested during their first registration period for competence in the use of oral and written English. Until such competence is determined, admission and arrangements for an award involving teaching must remain provisional. Students found to lack necessary competence should be prepared to assume all costs for being tutored in English and should reduce their course or research program by 3 units while being tutored. Students who do not successfully pass the test for competence in the use of oral and written English by the end of their first year of residency will not be permitted to continue their graduate work at Duke University.

The visa-granting authority in the student's country of origin, ordinarily the United States Embassy, requires proof that sufficient funds are available to the student to cover the expenses of all academic years of study before a visa can be granted. Foreign students are not eligible for federal and state loans, although they may qualify for certain educational loans through private United States agencies. Current immigration laws make it extremely difficult for the foreign student to find summer employment and permanent employment in the United States after graduation.

**Interviews.** An interview with a member of the admissions committee is not required but may be helpful to the applicant as well as to the school. Consequently, those applicants who can visit the school are encouraged to do so. The visit presents an excellent opportunity for the applicant to ask questions, gain insight into the school, and bring items of concern to the attention of the admissions committee. Applicants are encouraged to allow sufficient time to visit classes, meet students and faculty, and tour the university.

In general, visits can be scheduled on weekdays throughout the academic year. Appointments should be made at least two weeks in advance. Although visits during the summer months are possible, they should be scheduled well in advance since no summer classes are taught and faculty are frequently away from campus. During the middle of the fall semester and near the beginning of the spring semester, formal visitation programs are hosted by the Enrollment Services Office of the Nicholas School of the Environment. Interested individuals should contact that office at (919) 613-8070 for additional information.

Each year representatives of the school travel throughout the country to visit undergraduate schools. Applicants from the cooperative colleges should check with their program adviser for details of these visits. Applicants from other institutions interested in meeting with a representative of the school should write or call the Office of Enrollment Services. In addition, it is sometimes possible to arrange an interview with an alumnus, particularly where distance precludes travel to Durham. In all of these situations the emphasis is on exchanging information with the applicant.

For further information or to arrange a school visit, applicants may write to the Office of Enrollment Services or call (919) 613-8070.

**Deferred Admission.** Normally, applicants are admitted only to the class for which they have applied. However, a deferral of admission may be granted for the applicant to gain experience or to strengthen academic qualifications for graduate study or for other valid reasons. Except in unusual circumstances, a deferral of admission cannot be granted for more than one year. Deferrals are granted on individual bases. The size of each class frequently precludes open-ended guarantees of future admission; however, applicants with substantial reasons for deferring the start of graduate work are encouraged to send a request to the Office of Enrollment Services as soon as possible after receiving an offer of admission. Offers of financial assistance are cancelled upon deferral of admission and students must be reconsidered for financial aid.

**Application Deadlines for the Professional Programs.** Application forms and all other information required to complete the application and to allow a student to be considered for admission should be submitted to the Office of Enrollment Services by

February 1 for the fall term and by October 1 for the spring term. All candidates for admission should make arrangements to complete the Graduate Record Examinations well in advance of these deadlines.

Offers of admission, including financial aid awards, are mailed to accepted students in March. Decisions on applications received after the February 1 deadline are held until May and are made on an individual basis according to the availability of student spaces and financial assistance.

**Response to Offer of Admission.** When admission is approved, the applicant will receive an offer of admission and an acceptance form. A nonrefundable tuition deposit is required with acceptance of the offer. The admission process is not complete until the acceptance form and the tuition deposit have been returned to the Office of Enrollment Services. Failure to respond by the stated deadline may result in cancellation of acceptance.

## **Admission as a Senior Professional Program Participant**

Applicants for either the Master of Environmental Management or Master of Forestry degree through the Senior Professional Program follow the same application procedures as regular students in the school. Applications should be submitted by February 1 for the fall term and by October 15 for the spring term. Normally, degree candidates in the Senior Professional Program take the required semester in residence during the term following admission.

Degree candidates enrolled through the Senior Professional Program are considered part-time students and are therefore not eligible for financial assistance from the Nicholas School of the Environment. They may, however, be eligible for federally funded student loans.

## **Admission to the Graduate School**

Applications for Admission to Ph.D. degree programs should be obtained from and returned to the Dean of the Graduate School, Duke University, Box 90065, Durham, N.C. 27708-0065. Applicants to these programs must follow the procedures and meet the deadlines specified by the Graduate School. Initial inquiries and questions concerning fields of study are best directed to the director of Graduate Studies, Nicholas School of the Environment. In addition, prospective students are urged to write directly to professors whose research interests match their own to discuss opportunities. Although the priority application deadline for the Graduate School is December 31, applicants are encouraged to apply by December 1.

## **Admission with Nondegree Status**

Persons wishing to enter the Nicholas School of the Environment as nondegree students must submit a special application form requesting nondegree status along with an application fee of \$25. The applicant must have completed a bachelor's degree from an accredited college or university and must submit an official transcript of all previous course work. The Graduate Record Examination is not required although the GRE score is helpful in the admissions process. The student must have one letter of recommendation; this letter should indicate why the applicant should be allowed to undertake nondegree study at Duke. The application itself requires a brief statement of purpose in which the applicant should state his or her reasons for such study at Duke.



*Financial Information*



## Tuition and Fees\*

**Estimated Expenses for the Academic Year.** The following approximate costs, applicable in 1997-98, are indicative of costs that can be expected by M.E.M. and M.F. candidates; Ph.D. students should consult the *Bulletin of the Graduate School*.

|   |          |
|---|----------|
| Tuition (\$8,650 per semester)          | \$17,300 |
| Student health fee (\$208 per semester) | \$416    |
| Student government fee                  | \$14     |
| Housing                                 | \$3,950  |
| Food                                    | \$3,200  |
| Books and supplies                      | \$750    |
| Transportation                          | \$1,030  |
| Motor vehicle registration              |          |
| automobile                              | \$73-180 |
| motorcycle                              | \$42     |

In addition to these necessary expenses, the student will incur others which will depend to a large extent upon individual tastes and habits. The average Duke student, however, can plan on a budget in the range of \$23,000 to \$28,650 for the academic year. Students with families naturally will have higher expenses.

**Flat-fee Tuition.** The flat-fee tuition allows Master of Environmental Management and Master of Forestry degree candidates to register for 9 or more units of credit for a fixed tuition payment per semester. The normal full-time enrollment is expected to be 12 units per semester, although units may vary from 9 to 15 depending upon the student's academic and assistantship requirements. Permission is required to register for fewer than 9 or more than 15 units in a semester.

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\*The figures contained in this section are projections and are subject to change.

Students in the two-year M.E.M. and M.F. programs will pay the flat-fee tuition for four semesters. Students in one of the concurrent degree programs will pay the flat fee for those semesters in which they are registered as full-time students in the Nicholas School of the Environment. Students in the concurrent M.E.M./M.F. program pay the flat-fee tuition for a minimum of five semesters. Students in the one-year M.F. degree option will pay the flat fee for two semesters.

If the student is permitted to be enrolled part time (fewer than 9 units), he or she will be charged per unit of credit (\$750 per unit for the 1997-98 academic year).

Students who wish to earn additional credits during the summer will be charged at the part-time rate per units of credit. Students who have completed the required semesters in residence and all course requirements except the master's project will be charged a minimum registration fee (\$350 for 1997-98) each semester until the degree is completed.

All students are expected to be registered in residence, to be approved for a leave of absence, or to pay a minimum registration fee for each semester until their degree is completed.

**Payment of Accounts.** Invoices for tuition, fees, and other charges are sent by the Office of the Bursar and are payable by the invoice due date. As a part of the agreement of admission to Duke University, a student is required to pay all invoices as presented, unless other arrangements are made in advance. If full payment is not received, a late payment charge as described below will be assessed on the next invoice and certain restrictions as stated below will be applied. Students interested in arranging a payment plan should contact Tuition Management Services, 42 Valley Road, Newport, R.I. 02842-6376; telephone 800-722-4867.

**Late Payment Charge.** If the *total amount due* on the student invoice is not received by the invoice due date, a penalty charge will be accrued from the billing date. The penalty charge will be at a rate of 1.25 percent per month (15 percent per annum) applied to the *past due balance*. The *past due balance* is defined as the previous balance less any payments and credits received during the current month. Student loan payments, if delayed for reasons beyond the individual's control, are treated as a credit on the student's invoice until the loan payment is received.

**Restrictions.** An individual will be in default of this agreement if the *total amount due* is not paid by the due date. An individual who is in default will not be allowed to register for classes, receive a copy of the academic transcript, have academic credits certified, be granted a leave of absence, or receive a diploma at graduation. In addition, an individual in default may be subject to withdrawal from the university.

**Tuition Refund Policy.** In case of withdrawal from the university, Title IV federal financial aid received by students enrolled for the first time at Duke will be refunded on a pro rata basis. The pro rata formula is defined as the total school charges times the remaining portion of the enrollment period for which the student has been charged, rounded downward to the nearest 10 percent, less any unpaid charges owed by the student. The pro rata refund policy does not apply to any student whose withdrawal is after the 60 percent point in the period of enrollment. Sample refund calculations are available from the enrollment services office.

If the student receives federal financial aid but is not attending the university for the first time or if the student does not receive federal financial aid, tuition will be refunded or carried forward as a credit for later study according to the following schedule:

| Withdrawal                         | Refund      |
|------------------------------------|-------------|
| Before classes begin               | full amount |
| During first or second week        | 80 percent  |
| During third, fourth or fifth week | 60 percent  |
| During sixth week                  | 20 percent  |
| After sixth week                   | none        |



This schedule also applies to housing charges of students moving from university housing to off-campus housing. The student health fee will not be refunded except when withdrawal occurs before classes begin. In the event of death, a full refund of tuition and fees will be granted.

**Late Registration.** Students who register at a date later than that prescribed by the university must pay a fee of \$25 at the bursar's office.

**Audit Fee.** Students registered for a full course load may audit courses without charge. Otherwise, audit fees are \$750 per course.

**Transcripts.** Transcripts are available on request from the Duke University Office of the Registrar. During their first semester in residence, students are charged a \$30 fee that covers the request of transcripts. Transcripts cannot be issued by the Nicholas School of the Environment.

**Housing Charges.** On-campus housing for professional and graduate students is available on a limited basis. Questions regarding costs should be addressed to the Office of Housing Administration, Duke University, Box 90451, Durham, N.C. 27708-0451.

**Motor Vehicles.** Motor vehicles parked on campus must be registered with the parking services office. Registration must be completed within five days after operation on campus begins. The proper registration decal should be displayed on the vehicle. The automobile registration fee is \$73 in ungated lots and \$180 in gated lots. Motorcycle registration is \$42.

**Student Health Fee.** All students are assessed a fee for the Student Health Service. For the fall and spring, the fee is \$416 (\$208 per semester). For the summer, the fee is \$66 per term.

**Medical Insurance.** All resident students are automatically billed for health insurance at the rate of \$667 per year (single student cost). Family plans are more and are available through the university bursar's office. A student who is covered under a family, group or individual major medical policy must sign a waiver form indicating that he/she does not wish to be covered by the university student insurance policy. All foreign students are required to register for student insurance (and for the family plan if they have a spouse or children living in Durham) unless they have valid documentation indicating major medical coverage acceptable in the United States.

**Tuition and Fees for the Summer.** For M.E.M. and M.F. students who wish to take additional credits during the summer, registration is charged per unit of credit (\$750 per unit in summer 1998). The summer student health fee and audit fee are listed above. Information on fees, housing, policies and procedures related to the Duke University summer session is available from the Office of Summer Programs, The Bishop's House. Students who are interested in summer study in Beaufort should consult the *Bulletin of the Nicholas School of the Environment Marine Laboratory*.

**Athletic Events.** Students are admitted free of charge to all regularly scheduled university athletic events held on campus during the academic year, with the exception of basketball. Students who wish to attend home basketball games must enter the student ticket lottery and pay for tickets if selected.

## Financial Assistance

Financial assistance in the form of scholarships, fellowships, or assistantships is available for qualified students pursuing either the professional degrees (M.E.M. or M.F.) or the graduate degrees (Ph.D.). Students enrolled through the Senior Professional Program are not eligible for school supported financial assistance but may be eligible for federally funded student loans.

All professional degree students must file the Free Application for Federal Student Aid (FAFSA) to be considered for student loans and work study. A separate application must be filed for each academic year.

Applicants may obtain a FAFSA form from a college or university counseling and placement center or financial aid office. Professional degree applicants must also complete the financial aid form included in the admissions materials. Scholarships are granted from university funds which are in limited supply. Consequently, only well-qualified students can expect to receive awards. Scholarships are awarded on the basis of demonstrated outstanding academic ability and a high degree of professional promise.

Fellowships are obtained from foundation grants, private industry, or individual donors. Donors of fellowship funds sometimes place restrictions on the use of the funds as well as on the amount of awards.

Research assistantships are obtained primarily from grant and contract funds awarded to various faculty in the school. University-funded assistantships are available for students who have sufficient experience to contribute to one or more ongoing research or academic programs.

Pursuant to the Tax Reform Act of 1986, students performing any services (whether degree related or not) required by their scholarship, fellowship or assistantship must have income taxes withheld. However, if the student anticipates no tax liability at the end of the calendar year, he or she can note "exempt" on the state and federal withholding forms and no taxes will be withheld. Income tax information is reported to the student by the university in January.

In all instances, admission to the school is a prerequisite for the award of assistance in any form. If offered financial assistance, professional students normally will receive the award for two years of study; it is expected that they will complete their degree within this period of time. For graduate students, it is the policy of the school to provide financial assistance through university funds for three years; it is expected that Ph.D. candidates will obtain research grants to fund their study past the third year. However, the school has the right to examine the progress of each student to determine eligibility for continuation of awards beyond the first year.

No student will receive financial aid while on probation unless an appeal is approved by the Admissions and Awards Committee.

## Eligibility for Financial Assistance

A significant portion of the financial assistance for students in the Nicholas School of the Environment is provided by federal, Title IV funds. To qualify for such funding, usually in the form of loans, students must meet federal eligibility requirements including the maintenance of satisfactory academic progress. Professional degree students must complete at least 18 units of course work with at least 6 units of C and/or D grades during the first full year of study and may not receive a grade of F in any course to be eligible for federal financial aid for their second year.

Although professional degree students have five years from the first date of matriculation in the school to complete their degree requirements, they are eligible for federal financial assistance for the equivalent of four full-time semesters only. Students who fail to meet the satisfactory academic progress requirements or need federal financial assistance for more than the equivalent of four semesters may appeal to the admissions and awards committee.

Graduate degree candidates should review the *Bulletin of the Graduate School* for details regarding satisfactory progress for their degree program.

## SCHOLARSHIPS

**University Scholarships.** A limited number of scholarships are awarded each year to selected students who are pursuing either professional or graduate degrees. Awards

are made on the basis of academic qualifications and professional or scientific promise. Amounts of awards vary.

## **FELLOWSHIPS**

**Rachel Carson Graduate Fellowship.** A fellowship is awarded to a selected student who is conducting research related to some aspect of the Rachel Carson Estuarine Research Reserve.

**Federal Paper Board Company Fellowship.** A fellowship is awarded each year to a selected student interested in a career in industrial forestry. The stipend ranges up to \$5,000 per year.

**Virlis L. Fischer Fellowship.** A fellowship is awarded each year to a second-year Master of Environmental Management or Master of Forestry candidate with demonstrated financial need. The stipend is determined by the amount of endowment income each year.

**Leroy B. George Fellowship.** A fellowship is awarded to a selected student from the Haywood or Buncombe counties or the Hendersonville, North Carolina, school systems. Second preference is given to a student from the southern Appalachian region. If a qualified student cannot be identified within the region the fellowship may be awarded to a student in the school who has a demonstrated interest in resource and environmental education and planning. The amount of the fellowship is set at \$1,000 per year.

**Richard E. Hug Fellowship.** A fellowship is awarded to a selected student who is pursuing a Master of Environmental Management or Master of Forestry degree. The stipend ranges up to \$2,000 per year.

**Integrated Case Studies Fellowship.** Fellowships are awarded to selected students who present appropriate case study proposals in applied ecology. Stipends range up to \$3,000 per year.

**Mary Derrickson McCurdy Graduate Fellowship.** A fellowship is awarded to a selected student who is conducting research at the Nicholas School of the Environment Marine Laboratory.

**Andrew W. Mellon Foundation Fellowship.** Fellowships are awarded each year to selected students pursuing master's or Ph.D. degrees. Stipends range from \$1,000 to \$5,000 a year.

**Muchnic Foundation Endowment Fellowship.** A fellowship is awarded each year to a selected Master of Environmental Management or Master of Forestry candidate who has demonstrated financial need.

**Robert Safrit Graduate Fellowship.** A fellowship is awarded to a selected student who is conducting research in some aspect of marine science at the Nicholas School of the Environment Marine Laboratory.

**Nicholas School of the Environment Alumni Association Fellowship.** Fellowships are awarded each year to selected students who are pursuing a Master of Environmental Management or Master of Forestry degree. The students must have completed one year of study. The amount of the fellowships is set at \$2,000 per year.

**Nicholas School of the Environment Alumni Association Minority Fellowship.** A fellowship is awarded to a selected minority applicant for the Master of Environmental Management or Master of Forestry degree. The amount of the award is determined by the endowment income each year.

**Harvey W. Smith Graduate Fellowship in Biological Oceanography.** A fellowship is awarded to a selected student who is conducting research in biological oceanography at the Nicholas School of the Environment Marine Laboratory.

**Frederick K. Weyerhaeuser Forest History Fellowship.** This fellowship is



available campus-wide to graduate students who wish to study broadly in the area of forest and conservation history. The annual stipend is \$11,000. Inquiries should be made to the Forest History Society, 701 Vickers Avenue, Durham, N.C. 27701.

**Sara and Lewis Zirkle Fellowship.** Fellowships are awarded to selected students pursuing master's or Ph.D. degrees. The stipend is determined by the amount of the endowment income each year.

## **ASSISTANTSHIPS**

**Assistantships for the Professional Degree Candidate.** Assistantships may be awarded to a select number of professional students during their first year of study to assist faculty and staff with teaching, research, professional and other projects. It is expected that students will work for 10 hours a week on their assigned project. *Assistantships require a regular schedule for work to be arranged between the student and the faculty or staff member to whom he or she is assigned.* During the second year of study, professional students may fulfill the assistantship requirement by working independently on their master's project.

The hours of assistance may limit the number of credit hours for which a student may register. Normally, professional students who receive assistantships for 10 hours per week are limited to 12 units of credit per semester. Exceptions require the permission of the student's adviser.

Most assistantships are paid by the school on the monthly payroll. For the 1997-98 academic year, the award for 10 hours of assistance was \$3,000.

Normally, assistantships are available only for the academic year and require full-time enrollment in the school. A few awards may be available during the summer, however, for faculty research, staff, and Duke Forest assistance. Summer stipends are paid on a biweekly or monthly basis.

**Teaching Assistantships for Ph.D. Candidates.** A selected number of Ph.D. candidates each year may be offered a financial aid package consisting of full tuition plus a monthly stipend. The tuition is a scholarship from school funds and is tax exempt. The monthly stipend (\$1,222 per month in 1997-98) requires 10 to 12 hours of work per week during the academic year and is taxable. Students receiving these stipends are assigned by the director of graduate studies to serve as teaching assistants for various faculty. Normally these teaching assistantships are available only for the first three years of graduate study.

These graduate assistants may be retained by the faculty through research funding for the remaining three months of the summer.

Typically, the Ph.D. candidate is assigned to a member of the faculty to work on a particular research project under his or her direction and/or to provide teaching assistance. Furthermore, the research undertaken is normally a part of the student's graduate program and serves as a basis for the doctoral dissertation. With few exceptions, assistantships are available only for the first three years of graduate study.

Graduate assistants are required to maintain a regular schedule of work as determined by the faculty member to whom each is assigned.

**Research Assistantships.** Funded from grant and contract research under the direction of various members of the faculty, research assistantships provide support during the latter stages of study of the Ph.D. candidate. Typically, the research assistant completes one or more phases of a research project under the direction of the principal investigator, a member of the faculty. Normally, the research completed forms a substantial component of the requirements of the Ph.D. dissertation. However, in some instances this may not be the case and the students pursue dissertation research in a related area of study.

The stipend and level of service required of research assistants depend primarily on the nature of a particular research project and the availability of funds. Normally, research assistants are committed to 720 hours of service during the academic year (20

hours per week). Some research assistantships require full-time service during the summer. A regular schedule of research under the direction of the principal investigator must be maintained.

**Work-Study.** Work-study funds are administered for student employment through the Office of Enrollment Services. At the beginning of the academic year, students are made aware of work-study opportunities and informed of the application procedures. Interested students should file the Free Application for Federal Student Aid (FAFSA).

## Application for Awards for the Entering Student

Application for awards is made concurrently with the application for admission. Applicants should initiate the necessary action early to ensure that the required documents are filed with the school's Office of Enrollment Services on or before February 1 prior to enrollment.

**Notification and Acceptance of Awards.** Recipients of awards are notified in March. Completed applications received after the February 1 priority deadline will be considered if vacancies occur at a later date.

Scholarships, fellowships, and the various categories of assistantships provide the basis for professional/graduate student support. Once offered by the university or the school, funds are committed to one student and are therefore unavailable to others. *As a consequence, it is the policy of the school that all awards offered can be declined prior to May 1 without prejudice. However, offers accepted and left in effect after May 1 are binding for both the student and the school.*

## Loans

In terms of a needy student being able to afford the graduate program of his or her choice, federally insured student loans are often necessary and useful. Students should consider the nature of the loan and the positive and negative aspects of future loan payments, as well as investigate all other forms of financial assistance.

Federal law requires all students to have completed a Free Application for Federal Student Aid (FAFSA) to determine financial need. The FAFSA form may be obtained from a college or university counseling and placement center or financial aid office. No loan application will be processed without the FAFSA form having been submitted to the central processor.

In addition, federal law requires submission of financial aid transcripts from colleges previously attended, a statement of educational purpose, and a statement of compliance with Selective Service registration. In some cases, verification of income and other information are required.

**Federal Stafford Loans.** Federal Stafford Loans of up to \$18,500 (\$8,500 subsidized and \$10,000 unsubsidized) are available for eligible graduate/professional students. For loans made to new borrowers, interest is calculated at a variable rate, not to exceed 8.25 percent. Students who have outstanding loans retain their current interest rate. If a student is eligible for a subsidized Federal Stafford Loan, the interest is paid by the federal government while the student is enrolled in school. Interest on unsubsidized loans must be paid by the student during enrollment or capitalized to the principal at the borrower's request.

Students may be eligible for a combination of subsidized and unsubsidized loans. Eligibility for the subsidized loan is determined by subtracting all financial aid awards and the student's expected contribution from the Nicholas School of the Environment's student budget. The student's contribution is computed from the income and asset information submitted on the FAFSA. Eligibility for the unsubsidized loan takes into consideration the other financial aid being received by the student, but the expected student contribution is not considered. Students may borrow from the unsubsidized

loan program the difference between the student budget and their other aid (including any subsidized Stafford Loan), up to a maximum of \$10,000 for an academic year.

To obtain a Federal Stafford Loan, students may apply to either a state agency or a bank that participates in the program. A partial listing of lenders is available from the school's enrollment services office.

Students who borrow through the Federal Stafford program will be given entrance and exit interviews concerning the projected and actual costs of their loans. They will also be provided with information on loan consolidation, should this be desired or needed.

**Federal Carl Perkins Loans.** Loans through the Federal Carl Perkins program are administered through the university for students who qualify under the federal guidelines. The student must qualify as needy by the FAFSA form and in need of additional assistance beyond the maximum Federal Stafford allocation. The interest rate is 5 percent, with payment on interest and principal deferred until six months following graduation.

**Duke Signature Select Loans.** For students who need more funds than are available through the Federal Stafford Loan and the Federal Carl Perkins Loan programs, the University offers the Duke Signature Select Loan program. Through this program, students can borrow up to \$12,500 without a co-signer or up to the cost of education (minus other aid received) with a co-signer. The interest rate on this loan is T-bill plus 2.5 percent while the student is in school and T-bill plus 3.1 percent during repayment. Repayment begins 6 months after graduation or dropping to less than half-time enrollment. Applications can be obtained by contacting the Office of Enrollment Services in the Nicholas School at (919) 613-8070.

**GradSHARE Loans.** Duke University participates in a private student loan program called GradSHARE which enables students to borrow up to \$15,000 per year to meet educational expenses. Repayment of the principal and interest may be deferred. Two interest rate options are available: a monthly variable rate that does not exceed the prime rate, or a one-year renewable rate that is set annually and will not exceed the prime rate.

Unlike the federally subsidized loans, GradSHARE loans are available to students who do not qualify under federal guidelines. Under GradSHARE a graduate or professional student may be able to borrow up to \$7,500 per year without a cosigner.

Interested students should write directly to the school for further information.

**Federal Grant Programs.** Students with only three years of study at one of the institutions in the Cooperative College Program may be eligible for undergraduate state and federal grant programs. Such students should consult their undergraduate financial aid officers, state loan agencies, or federal granting agencies for applications, requirements, and restrictions.





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*Marine Laboratory*







## General Information

The Marine Laboratory is a campus of Duke University and a unit within the Nicholas School of the Environment. Its mission is education and research in basic ocean processes, coastal environmental management, marine biotechnology and marine biomedicine. The laboratory operates year-round to provide training and research opportunities to about 3,500 persons annually, including undergraduate, graduate and professional students enrolled in the university's academic programs; visiting student groups who use the laboratory's facilities; and scientists who come from North America and abroad to conduct research. A seminar/lecture series features many distinguished scientific speakers from across the nation and abroad.

The resident faculty represent the disciplines of oceanography, marine biology, marine biomedicine, marine biotechnology, and coastal environmental management.

## Location and Natural Environment

The Marine Laboratory is situated on Pivers Island within the Outer Banks of North Carolina, only 150 yards across the channel from the historic town of Beaufort. A bridge connects the island with US Highway 70, making the laboratory readily accessible by automobile. Other transportation to the area consists of bus service to Morehead City, about two miles distance from Beaufort, and airline service via regional airports (New Bern, Kinston, and Jacksonville).

Beaufort is the third oldest town in the state and is surrounded by fishing and agricultural communities. The area is well known for its historic and scenic attractions as well as being a seaside resort. Cape Lookout National Seashore Park and the Rachel Carson Estuarine Research Reserve are within easy boating distance.

The area's system of barrier islands, sounds, and estuaries is rich in flora and fauna, and diverse habitats, including rivers, creeks, mud flats, sand beaches, dunes, marshes, peat bogs, cypress swamps, bird islands, and coastal forests, making the area a haven for both nature lovers and those interested in the pursuit of marine science.

The laboratory is within range of both the temperate and tropical species of biota. The edge of the Gulf Stream oscillates between 30 and 40 miles offshore, with reefs on the wide continental shelf. A great variety of phytoplankton, seaweeds, seagrasses, and marshgrasses may be found in the area. Common animals include the blue crab, squid, shrimps, snails, clams, ctenophores, jellyfish, hydroids, sponges, polychaetes, sea urchins, starfish, brittle stars, sand dollars, skimmers, terns, gulls, herons, sea turtles, porpoises, and many species of fish. All provide ample opportunity for study and research and are readily accessible on foot, by car, or by boat.



The Beaufort-Morehead City area provides location for five other laboratories that collectively house one of the higher concentrations of marine scientists in the nation. These are the University of North Carolina's Institute of Marine Sciences, the North Carolina State University Seafood Laboratory, the North Carolina Aquarium at Bogue Banks, North Carolina Division of Marine Fisheries; and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, Beaufort Laboratory. This concentration of marine scientists provides a critical mass for the pursuit of science and education.

## The Beaufort Experience

The Marine Laboratory is an academic community, and the self-sufficient nature of its residential life serves well those who wish to study or to conduct research. The academic programs are limited to eighty students per regular academic semester (spring or fall) and one hundred per summer term, offering an unparalleled small-group learning experience. Although recreational opportunities are ample, the distractions are limited, allowing both student and researcher to become totally involved in the pursuit of marine science. Both students and researchers alike find that the Marine Laboratory has an invitingly open, friendly, and relaxed atmosphere that draws many back year after year. This community feeling, the potential for total immersion in learning, and the beauty of the natural environment have contributed to what has been called "The Beaufort Experience."

## Teaching and Research Facilities

The Marine Laboratory's modern physical plant consists of twenty-three buildings, including four dormitories, a large dining hall, one residence, a boathouse that has been remodeled as a student commons, a storehouse for ship's gear, classroom laboratories, six research buildings, and a maintenance complex. The Marine Laboratory operates the R/V *Susan Hudson*, a 57-foot fully-equipped coastal oceans research vessel, and is the home port for the R/V *Cape Hatteras*, a 135-foot oceanographic research vessel operated by the Duke/University of North Carolina Oceanographic Consortium.

The laboratory also maintains an electronics shop, a workshop, a stockroom, and a purchasing department.

Each research laboratory building is air-conditioned and equipped with running seawater through a PVC system. There are tanks, water tables, aquaria, autoclaves, ovens, and outdoor continuous-flow growth facilities. In addition to commonly used laboratory equipment, the following are available: refrigerated centrifuges, fluorometers, spectrophotometers, balances, pH meters, hoods, liquid scintillation counter, constant temperature equipment, and HPLC.

The Marine Laboratory houses two Sun Sparc stations as well as two Duke University public access clusters, MAC and IBM-PC, all connected to the Internet. Available for use are eleven 586-based workstations and five Power PCs with word processing and statistics programs.

The laboratory operates an AT-compatible computer for processing and analysis of static and moving images. Static images captured with a video camera and Targa-M8 frame grabber board can be analyzed by means of the JAVA software (Jandel Scientific). Graphic and printed output of results is possible using an HP 7475A plotter or an HP LaserJet printer. Moving images are recorded on video tape and analyzed using the Motion Analysis System (Celltrack Motion Analysis Expertvision System, Motion Analysis Corp.). A video processor in an IBM/AT-compatible computer tracks objects and calculates direction of movement, velocity, and rate of change of direction. Statistical and graphics programs allow final processing of these data.

Color printing and scanning services are also available on the island.

Research and teaching facilities also include the I. E. Gray Library-Auditorium which houses the Pearse Memorial Library, a branch of the Duke library system. It holds

approximately 23,000 volumes with a concentration in the marine sciences. The library currently subscribes to 60 scientific journals and a few CD ROMs. Support services include a general access copier, interlibrary loan with the Duke-UNC-NCSU library systems, and on-line literature search capabilities.

Cooperative agreements for interlibrary loan and document delivery service have also been established with the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA/NMFS) and University of North Carolina Institute of Marine Sciences (UNC/IMS), and University of North Carolina at Wilmington.

## Opportunities for Students

The resident faculty offer a wide variety of graduate courses in the marine sciences that are appropriate for students planning careers in basic or applied research and/or teaching, environmental management or policy sciences, or environmental health sciences. Courses are offered during both the academic year and the summer. Many Environment courses are cross-listed with the Graduate School Departments of Botany, Cell Biology, Public Policy Studies and Zoology. Graduate research or individual study courses are also offered. Most of the summer courses carry 4 or 6 units of credit and include laboratory and direct field or shipboard experience.

Students have access to all laboratory facilities and the opportunity to meet visiting scientists from around the world. Room and board are available, and summer tuition scholarships are offered on a competitive basis.

Further information and application materials may be obtained from the Admissions Office, Duke University Nicholas School of the Environment Marine Laboratory, 135 Duke Marine Lab Road, Beaufort, N.C. 28516-9721; telephone (919) 504-7502.



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## *Research Centers*





Research centers in the Nicholas School of the Environment are by design and intent flexible, multidisciplinary units. A major aim is to bring together specialized groups of scholars and professionals from many disciplines to focus their attention on current natural resource and environmental problems. The centers are headed by a director and staffed by an interdisciplinary faculty from Duke, neighboring universities, and a variety of public and private research organizations. Depending upon the level of funding, the centers may also employ research assistants and other support staff. The centers do not offer courses or degrees; rather, they offer students, scientists and other professionals an opportunity to participate in research through collaboration with affiliated faculty.

## Forest Resources Center

Director: Daniel D. Richter, *Associate Professor, Nicholas School of the Environment*

The objective of the Center for Forest Resources is to promote and conduct research that increases the ability to understand, use, and conserve forest ecosystems. This research is conducted worldwide and is motivated by a broad number of issues, including ecosystem and biogeochemical sustainability, species competition, air pollution effects, water cycling, energy flow, economic values, conflict resolution over management alternatives, and policy analyses.

Duke's location in the USA South provides researchers and students with a special perspective of forestry ecology and management. The region is the world's most productive for forest wood products. Sustaining this enormous economic and ecosystem productivity depends upon long-term ecosystem dynamics that are strongly governed by a past in which these ecosystems have been intensively used and frequently degraded by agricultural practices, and a future in which improved management practices are critical to develop. Improving the water quality, soil capability, wildlife habitat, biogeochemistry, and management of these forest ecosystems are subjects of various studies.

Duke research on the southern pine is internationally regarded and includes the Korstian-Christensen studies of forest succession in the Duke Forest, the four-decade study of forest-soil biogeochemical sustainability at the Calhoun Experimental Forest in South Carolina, and the large collaborative project with Brookhaven National Laboratory to investigate effects of carbon dioxide on pine ecosystems in the Duke Forest.

The center benefits the school's educational activities in forest ecology, general ecology, silviculture, soil sciences, hydrology, modeling, and related social sciences. Center activities include a weekly discussion, guest speaker or forum. Ultimately, the center intends to be able to fund student research, fellowships, and visiting professorships.



## Center for Hydrologic Science

Director: Stuart Rojstaczer, *Associate Professor of Hydrology, Nicholas School of the Environment and Department of Civil and Environmental Engineering*

From global climate change to flooding to hazardous waste storage, the science of hydrology plays a key role in many problems facing society. Hydrology is the study of the hydrologic cycle and its components on land. Rivers, lakes, plants, soils, rocks and snow and ice provide the storages for water on land. Hydrologists are concerned with the magnitude of these storages over time and space and the rate of transfer of water from one storage to another. Key transfer processes include river flow, groundwater flow, evaporation, transpiration and soil moisture flow. Studies of these storages and transfer processes allow us to examine a variety of environmental problems and devise solutions for them.

The twentieth century and its associated environmental problems have brought about an explosion of studies in hydrology, particularly those studies that relate to environmental issues and water hazards. Hydrologists have their roots in and depend upon a variety of associated disciplines including Civil Engineering, Ecology, Environmental Engineering, Geology, Geophysics, Mathematics, Meteorology and Soil Science. At Duke University, we have reached across school and departmental boundaries to organize a university-wide program in hydrology.

The Center for Hydrologic Science, established in 1996 with funds from the provost's Common Fund, serves as a integrating center for hydrology research and graduate level hydrology education at Duke University. The Center's interdisciplinary nature reflects the interdisciplinary nature of the field of hydrology. The Center draws faculty and their associated students and post-doctoral researchers from three schools at Duke: Arts and Sciences, Engineering and the Nicholas School of Environment. Many faculty hold joint professorships in two of the three schools.

### Research specialties of the faculty include:

- Contaminant hydrology
- Environmental geophysics
- Forest hydrology
- Geomorphology
- Hydrogeology
- Mathematical models of multi-phase transport
- Micrometeorology
- Sedimentary geochemistry
- Sediment transport
- Soils and nutrient cycling
- Watershed hydrology
- Waste treatment

The broad range of faculty expertise in hydrology allows graduate students to obtain well balanced training in the classroom.

The center offers fellowships for graduate study in hydrology and organizes a lecture series that attracts speakers of international stature. Monthly colloquia are organized for student and faculty presentations from Duke as well as the nearby University of North Carolina at Chapel Hill and North Carolina State University in Raleigh. For students engaged in Ph.D. research the center offers a Certificate in Hydrology that is granted in addition to the Ph.D. degree in their host department.





## Center for Resource and Environmental Policy Research

Director: Robert G. Healy, *Professor, Nicholas School of the Environment*

The Duke University Center for Resource and Environmental Policy Research is committed to objective and timely analyses of critical natural resource and environmental issues, both national and international. During the past few years, a substantial and comprehensive body of legislation has been enacted to address resource and environmental problems, much of it strongly influenced by information provided by special interest groups. Often, this legislation has been drafted and passed in a quasi-crisis atmosphere with a consequent absence of mature deliberation. The center was developed in response to recognition of the many conflicts developing over competitive use of natural resources and consequent legislative regulation.

Because contemporary resource-environmental problems are deeply embedded in the social, economic, and political fabric of the country, they are in need of careful and deliberate study. It is in the national interest that such issues be examined in a setting conducive to independent thought with appropriate regard for timeliness of results and conclusions. The Center for Resource and Environmental Policy Research is a unit of Duke University designed specifically to provide the proper setting for such an approach.

**Among the current research topics are:**

- Land use planning and rural development
- Soil and water resources policy
- Forest economics and policy
- Environmental risk analysis
- International resource and environmental policies
- Coastal zone management
- Tourism and the environment
- Economic valuation of the environment
- Sustainable Third World development
- Waste management and recycling
- Business firms and environmental management

## **Duke University Wetland Center**

Director: Curtis J. Richardson, *Professor, Nicholas School of the Environment*

The goal of the Duke University Wetland Center is to provide sound scientific knowledge that will lead to sustainable wetland functions and values for the nation and the world. The center works toward this goal by conducting, sponsoring, and coordinating research and teaching on critical wetland issues.

Perhaps no single environmental issue has so polarized public opinion as the protection of wetlands. Part land, part water, wetlands are ecosystems in which water level and low oxygen support a unique ecological habitat conducive to the development of specific plant and animal species. The hydrologic and biologic nature of wetlands generally is poorly understood by the people expected to comply with wetland regulations. Many people are unaware of the connections between surface water and groundwater, and the link between the two that wetlands often provide. Similarly, people often are not aware of the economic and ecological importance of wetlands in improving water quality, providing flood control, supplying habitat for commercial fisheries, supporting waterfowl and wading birds as well as the hunting and recreational values these ecosystems provide. Further complicating the issue of appropriate wetland resource management, people want both the unfettered right to use their own land and the right to use unpolluted waters.

By bringing together scientists and professionals, the Duke Wetland Center is able to focus attention on these and other wetland issues of regional, national, and international scale. Core researchers for the center are the director, faculty, visiting scholars and graduate students. As part of a professional school within a private university, the Duke Wetland Center works independently on wetland issues without the political pressures often brought to bear upon public institutions.

**Selected current and proposed research activities are:**

- Effects of agricultural runoff on Everglades nutrient cycling and storage
- Water management strategies to sustain ecological integrity of the Everglades
- Assessment of wetland ecosystem functional response to highways
- Restoration of salt marshes and the evolution of wetland structure and function over time
- Microbial and chemical transformations of mercury in the Florida Everglades: Factors controlling mobility and rates of methylation and demethylation
- Integrating ecological wetland functions and human wetland values
- Restoration of surface mined lands
- Functional assessment of constructed wetlands versus natural wetlands
- The history of vegetation cover, fire, hydroperiod and water depth in the

wetlands over the past several hundred years

- Wetland hydrology, paleohydrology and hydrologic evolution

The Wetland Center is housed in the Levine Science Research Center on the Duke campus. The mailing address is Nicholas School of the Environment, Duke University, Box 90333, Durham, N.C. 27708-0333; telephone (919) 613-8008. The center also maintains an Everglades research laboratory near West Palm Beach, Florida.

## Marine/Freshwater Biomedical Center

Director: Celia Bonaventura, *Professor, Nicholas School of the Environment*

The Marine/Freshwater Biomedical Center of Duke University is a problem-oriented center that is nationally and internationally recognized for its contributions to environmental health. It integrates unique facilities and faculty expertise available on the Beaufort and Durham campuses of Duke University and applies this powerful collective strength to challenging problems of human and environmental health significance, with a focus on the adverse effects associated with the toxicity of metals and free radicals. Research advances by center investigators increase the understanding of underlying toxic mechanisms, so that good human and environmental health choices can be made.

The center is distinguished by its record in biotechnology, its interdisciplinary programs, and its effectiveness in advancing marine and freshwater model systems for mechanistic studies. It is unique in its intellectual setting, providing a bridge between Duke's nationally recognized School of Medicine, Nicholas School of the Environment and Marine Laboratory. In its physical setting it draws effectively on the institutes and industries of the Research Triangle of North Carolina. Through its interactive workshops and outreach efforts the center communicates research findings on marine and freshwater aspects of environmental health problems to the clinical and research arms of the medical community, policy makers and the public at large.

The specific aims of the center are to:

- Enhance the unique strengths of environmental health research programs of center investigators, drawing expertise from the university and from the region
- Provide a cohesive framework for interdisciplinary interactions, information exchange and innovative technology development focused on metal and free-radical toxicity
- Aid in the development and use of marine and freshwater model systems for mechanistic studies of human and environmental health relevance
- Enhance the application of existing high-tech facilities and methodologies to both individual and collective environmental health research programs
- Provide community outreach and education that informs scientists, policy makers and the public at large about environmental health issues and research advances

Feasibility studies are conducted to explore the advantages of various experimental approaches and to encourage innovative research.

Students interested in working with members of the center's participating faculty should direct their first inquiry to the Admissions Office, Duke University Marine Laboratory, 135 Duke Marine Lab Rd., Beaufort, NC 28516-9721; telephone (919) 504-7502. It should be noted, however, that the center does not grant degrees. Graduate students are enrolled in the degree programs of the respective department or school of their mentors.

Researchers may direct their inquiries to the office of the Marine/Freshwater Biomedical Center, telephone (919) 504-7508. Dr. Celia Bonaventura serves as center director.



## Program for the Study of Developed Shorelines

Director: Orrin Pilkey, *James B. Duke Professor of Earth Sciences, Nicholas School of the Environment*

The Duke University Program for the Study of Developed Shorelines was established in 1985 within the Department of Geology. The program takes a worldwide view of modern coastal processes and geologic hazards.

A wide variety of research projects are directed under the auspices of this program, whose ultimate goal is the examination of the geologic basis for managing developed shorelines in a time of rising sea-level.

### **Present projects include:**

- The study of the basis for prediction of beach replenishment success.
- Hurricane property damage mitigation on barrier islands.
- Evaluation of numerical models used to predict sand movement.
- Shoreface processes.

Research assistantships and other forms of support are available through the program.

The Program for Developed Shorelines is housed in the Old Chemistry Building on the Duke campus. The mailing address is Nicholas School of the Environment, Duke University, Box 90230, Durham, N.C. 27708-0230; telephone (919) 684-4238.

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*Alternative Educational Opportunities*



## Center for Environmental Education

Business leaders, environmental professionals, educators and policy makers must be increasingly well trained in order to meet today's environmental challenges. As problems become more complex, learning must become a lifelong pursuit. Continuing environmental education programs must keep pace with the demands that confront business executives, professionals in environmental fields, and those who educate tomorrow's leaders.

The Center for Environmental Education in the Nicholas School of the Environment serves the needs of both professionals and educators for specialized continuing education on environmental topics. The center provides participants with information, experiences and quality instruction by offering multidisciplinary approaches utilizing Duke University's unique set of resources in environmental sciences, engineering, policy and business. Collaborations with nearby universities are essential to the mission. A variety of continuing education intensive courses and workshops are offered throughout the year. Further information on programs offered through the center may be obtained from the school office.

## Intensive Courses and Workshops

Through the Center for Environmental Education, the Nicholas School of the Environment offers a series of continuing education intensive courses that are appropriate for both practicing professionals and advanced full-time students who are pursuing careers in resource management, policy and environmental science. The intensive courses are designed to allow regular students to blend theory with practical experience as well as to allow experienced professionals to update theory and methodology. Recognized subject matter specialists provide instructional resources not normally available to the university community. The result is an enriched educational experience through the exchange of ideas and information by participants of diverse backgrounds.

The continuing education intensive courses are typically organized into week-long modules. A course consists of one or two modules, each a discrete unit of study which may be taken alone for credit. In two-part courses, however, the first week may be a prerequisite to the second.



Based on available space, Nicholas School of the Environment students (M.F. and M.E.M. degree candidates) may register for the intensive courses two weeks prior to the first day of the course on a first-come, first-served basis; students in their second year of study are given priority. One unit of credit may be earned for each week of an intensive course. Students may not register for more than two intensive courses in a semester without special permission from their adviser and the continuing education program director.

Courses in the continuing education intensive course series are listed in a special section in the chapter "Courses of Instruction" in this bulletin. A brochure containing complete information on the courses to be offered during a semester may be obtained from the school office by calling 919-613-8082.

The Center for Environmental Education also offers one- to three-day seminars and workshops on issues in environmental science. These are sometimes custom-designed at the request of specific organizations and sometimes are open enrollment in format. Please contact the Center for Environmental Education at 919-613-8082 for further information.

## Programs in K-12 Education

The Center for Environmental Education strives to improve understanding of complex environmental issues among educators in primary and secondary education to raise the level of environmental literacy in future generations of citizens. Graduate and professional students wishing to improve their knowledge about environmental education and provide service to our communities through their environmental science knowledge can take advantage of a number of programs offered by the center. Interdisciplinary Curriculum Applications projects link Nicholas School graduate students with elementary school teachers to expand the dissemination of environmental content to traditional science and math curriculum as well as the realms of language arts, literature, social studies, and health. The Teacher/Researcher Partnership pairs high school teachers with Nicholas School researchers and students to transfer new environmental research technologies to the classroom. The biennial Coca-Cola Seminar Series is an emerging storehouse of educational products and resources for use by graduate students, faculty and staff. The MAT/MEM Program gives pre-service teachers an opportunity to combine a Master of Environmental Management with a Masters of Teaching.

## Cooperative Colleges

The Cooperative College Program is designed to coordinate the education of students in selected undergraduate schools with graduate programs in the broad area of resources and environment offered at Duke. Students are accepted for either of two degrees, the Master of Forestry (M.F.) or Master of Environmental Management (M.E.M.). Although the program is designed to accommodate a wide range of undergraduate backgrounds, experience indicates that it is best suited to majors in one of the natural or social sciences, pre-engineering, business, natural resources, or environmental science.

The program accepts students after three years of undergraduate study. With appropriate guidance, highly qualified students can reach a satisfactory level of preparation for graduate work at Duke in three years of coordinated undergraduate study. The baccalaureate degree is awarded by the undergraduate school after the student has earned enough units at Duke to satisfy the requirements of the undergraduate institution. Minimum time required to complete the bachelor's degree is two full-time semesters at Duke. After four semesters at Duke, in which a minimum of 48 units of credit is earned, students may qualify for one of the professional master's degrees.

A student interested in entering the Cooperative College Program should apply to one of the participating schools, a list of which is available from the Nicholas School of the Environment enrollment services office. Each can provide information on courses of study and bachelor's degree requirements. Students applying for admission to Duke after the third year of study should do so by February 1 of the third year. Applicants from the participating schools are considered regular applicants for admission and are judged by the same criteria; therefore, students should submit application forms, transcripts, letters of recommendation, and results of the Graduate Record Examination. If the student is applying for a 3-2 program, he or she must also submit a letter from the undergraduate dean approving the application.

## Duke/UNC Oceanographic Consortium

The Duke/University of North Carolina Oceanographic Consortium operates a 135-foot oceanographic research vessel, the R/V *Cape Hatteras*. The ship operates both on the continental shelf and in the deep sea in the western North Atlantic, concentrating in the region between Nova Scotia and the Caribbean. The ship is a member of the academic research fleet supported by the National Science Foundation for the purpose of providing oceanographic research opportunities to investigators. R/V *Cape Hatteras* is used for training at sea by the universities that make up the Oceanographic Consortium (Duke, North Carolina State, UNC-Chapel Hill, UNC-Wilmington, UNC-Greensboro, and East Carolina). The consortium also manages the acquisition and maintenance of oceanographic instrumentation used aboard the R/V *Cape Hatteras*, and holds annual meetings of ocean sciences staff and graduate students from member institutions. These meetings are held at the Nicholas School of the Environment Marine Laboratory.

## Forest History Society

Founded in 1946, the Forest History Society is a nonprofit, nonadvocacy organization committed to balanced and objective investigations of human interaction with the forest environment through time. Although its major focus is North America, the society is involved with a network of forest historians worldwide. In 1984, it became affiliated with Duke University and moved its headquarters to Durham.

The society emphasizes the utility of history to decision making in both the public and private sectors. The society believes that most currently held opinions are strongly influenced by perceptions of the past and that a clear understanding of what really happened, as today's issues evolved, is a vital component in the process of making prudent choices.

Five major emphases enable the society to achieve its goals: *Forest & Conservation History*, research and publication, archival collecting, library and reference, and service and professional outreach.

*Environmental History* is co-published quarterly with the American Society for Environmental History. Its refereed articles, book reviews, and bibliographic listings enable investigators to keep current with the field. Research and publications, supported largely by grants, focus on topics that are important today and are also significant historically. Among the current topics are the history of forest resource technology, forest economics, sustained-yield forestry, forestry on Native American lands, wood as an energy source, forest taxation, labor relations in the forest industries, and industrial forestry research.

The collection of archival materials has been a major effort since the society was founded. Included in the archives are the records of the American Forest Institute, National Forest Products Association, and the Society of American Foresters. The society's library and reference staff provide convenient access to the extensive literature of the field. Students and faculty of the university are welcome to use these valuable resources. The service and outreach emphasis enables society staff to be active

participants in their professions. Included are teaching and advising assignments at the Nicholas School of the Environment.

Inquiries regarding the facilities and services offered by the society may be addressed to Executive Director, Forest History Society, 701 Vickers Avenue, Durham, N.C. 27701; telephone (919) 682-9319.

## **Integrated Case Studies**

The case study approach to graduate education affords the student an opportunity to develop analytical and management skills through a close look at problems in resource and environmental management and policy. Case studies are used in class instruction in both traditional and intensive courses in several of the school's study areas.

In addition to utilizing completed case studies as course materials, students also have the opportunity to participate in the research and preparation of new case studies. The process of case preparation brings one in contact with professionals, businessmen, and others and offers a bridge between the academic curriculum and practical experience. This experience and the contacts made in the process of case research are valuable assets in securing employment.

The case studies are termed "integrated" case studies in natural resource analysis because they result from the cooperative efforts of a team of investigators comprising resource-ecologists, -economists, and -planners, as well as political scientists, sociologists, and others. The team approach is used in recognition of the fact that the successful analysis and resolution of the nation's complex resource and environmental problems requires a holistic perspective. Optimally, this results in an exploration of the full ramifications of utilizing natural resource systems.

Case study formats have varied. For example, projects have resulted in color and sound 16mm films, simulation games and workshop conferences, as well as written reports. Typical issues addressed by past case studies include highway siting, hazardous waste disposal, back country management, use of herbicides in forest management, and the development and management of wetlands.

Financial assistance, in the form of research fellowships, is available to qualified students interested in case study analysis. Up to 6 units of academic credit may be earned for case study work. Proposals for case studies are developed in consultation with the student's faculty adviser and the case studies director, Curtis J. Richardson.

## **Integrated Toxicology Program**

The Nicholas School of the Environment participates in Duke University's graduate program in toxicology. The Integrated Toxicology Program operates under a specific charter to develop holistic and innovative approaches to toxicology training for Ph.D. students and postdoctoral fellows.

Research in environmental toxicology within the Nicholas School of the Environment focuses on molecular and biochemical aspects of pollutant metabolism, adaptation, and modes of toxic action. The majority of this work employs freshwater, marine, and terrestrial organisms as toxicological models. The goals of toxicological research in the school are to achieve a fundamental understanding of processes governing the fates and effects of contaminants in the environment, and to elucidate linkages between human and ecosystem health. In order to achieve this goal, the curriculum and research activities of the program are designed to teach students the principles and methodologies of environmental chemistry, biochemistry, molecular biology, pathology, toxicology, ecology, and quantitative analysis. Upon completion of studies, the student is experienced in the design, execution and interpretation of current research in environmental toxicology. Completion of this training program at the Ph.D. level provides career opportunities in academia, industry, and research laboratories.



Training in environmental toxicology is also available to professional students in the Nicholas School of the Environment through the Master of Environmental Management program in environmental toxicology, chemistry, and risk assessment. M.E.M. students have access to courses in the Integrated Toxicology Program curriculum and receive training appropriate for careers in industry, consulting firms, and government agencies concerned with the understanding and management of hazardous substances.

Students seeking admission to the program as a Ph.D. candidate make initial application to the Graduate School for admission to participating departments, including the Department of the Environment. Fellowships are available to outstanding students.

## **Intensive Courses**

Through the Center for Environmental Education, the Nicholas School of the Environment offers a series of continuing education intensive courses that are appropriate for both practicing professionals and advanced full-time students who are pursuing careers in resource management, policy, and environmental science. The intensive courses are designed to allow regular students to blend theory with practical experience as well as to allow experienced professionals to update theory and methodology. Recognized subject matter specialists provide instructional resources not normally available to the university community. The result is an enriched educational experience through the exchange of ideas and information by participants of diverse backgrounds.

The continuing education intensive courses are organized into week-long modules. A course consists of one or two modules, each a discrete unit of study which may be taken alone for credit. In two-part courses, however, the first week may be a prerequisite to the second.

Based on available space, Nicholas School of the Environment students (M.F. and M.E.M. degree candidates) may register for the intensive courses two weeks prior to the first day of the course on a first-come, first served basis; students in their second year of study are given priority. One unit of credit may be earned for each week of an intensive course. Students may not register for more than two intensive courses in a semester without special permission from their adviser and the continuing education program director.

Courses in the continuing education intensive course series are listed in a special section in the chapter "Courses of Instruction" in this bulletin. A brochure containing complete information on the courses to be offered during a semester may be obtained from the school office.

## **Interaction with Professionals**

Using discretionary funding from a variety of sources, the Nicholas School of the Environment sponsors a Distinguished Visitor Series to bring outstanding guests to visit the school. The major focus of the visitor's day on campus is a seminar on current environmental and natural resource management concepts, practices, and policy. Topics and speakers are selected in accordance with interests of faculty and students to reflect national and international issues. Speakers are drawn from the senior administrative ranks of public agencies, industries, nonprofit organizations, and the consulting field. Each presentation is accompanied by an informal luncheon or small group meetings with students and faculty, which permit continued discussion.

In addition to the Distinguished Visitor Series, the grants help to support other courses and activities that meet the objective of the exchange of ideas between practicing natural resource professionals and university students and faculty. These activities include an environmental seminar series, a forest utilization field trip to industry facilities in the South, and a western field trip.

The school recognizes the importance of graduate and professional student participation in professional organizations and makes available a limited amount of discretionary funding for activities that enhance the student's educational experience. Grants are available on a competitive basis for individuals who wish to attend or present papers at conferences and scientific meetings.

## **International Studies**

The Nicholas School of the Environment has a history of contribution to international education and research. Graduates of the school, many of them foreign nationals, hold significant positions in many countries in multinational corporations, United States government agencies, or resource and conservation organizations that have global responsibilities. Members of the faculty have served overseas in programs of teaching and research, in both the developed and developing parts of the world.

The contemporary need for greater attention to international studies has led the school to develop professional associations and curriculum options for students who wish to combine international interests with study of natural resources and the environment. Duke University is a member of the South Atlantic States Association for Asian and African Studies and the Organization for Tropical Studies. On campus, an active Center for International Studies, Center for Tropical Conservation, and Center for International Development Research provide a rich array of educational and research opportunities with global emphasis. Within the Nicholas School of the Environment there is an active student international environmental study group. The potential exists for student participation in international projects through competition for grants and fellowships. In addition, students in the school may elect area studies or languages to further their understanding of global issues and cultures.

The school welcomes foreign students and considers an international student body of value to the learning environment. Qualified foreign students in Trinity College and in graduate and professional schools of the university are admitted to courses in the school, subject to the approval of the student's adviser and the course instructor.

## **Internships**

An internship with a public agency, corporation, consulting firm, or conservation organization is a valuable part of graduate professional education. The Nicholas School of the Environment Office of Career Services works with natural resource professionals to develop paid intern opportunities for professional and graduate degree candidates. Most students pursue internships during the summer between their first and second years of study, although internships may be taken at other times and for a longer duration. Many students use the intern experience as a basis for the master's project. Further information may be obtained from the school office.

## **Professional Skills Development**

In addition to regular courses and seminars, the Nicholas School of the Environment offers a series of optional professional development lectures and workshops to prepare students for professional employment. Topics for these modules include field and laboratory techniques, communications skills, project organization and management, and teamwork skills. The schedule and detailed information concerning the series is made available to students during the academic year by the director of professional studies. A modest amount of credit is available for participation in these modules.





## *Career Planning and Placement*



## Career Services

The Nicholas School of the Environment operates its own Office of Career Services for all graduate and professional students and alumni of the school. Assistance is given to students in finding summer employment and internships, permanent employment upon graduation, and mid-career changes of employment.

**Career Planning Seminars.** Individual counseling and group workshops are provided by a professional staff member to assist students in the development of job search strategies and skills, resume preparation, and interviewing techniques. Presentations by employers and alumni of the school enable students to discuss employment options with practicing natural resource professionals.

**Internships.** Practical experience is central to our educational process. Although the Nicholas School of the Environment does not require internships, students are strongly encouraged to explore career options and enhance their professional training through paid internships with public or private sector natural resource employers. The Office of Career Services has information on a variety of options that students may consider when arranging practical training. See also the section on internships in the chapter, Additional Educational Opportunities.

**Job Search Assistance.** The Office of Career Services maintains a current listing of employment opportunities from private industry; local, state, and federal governments; universities; and nonprofit organizations. Career planning and employment resource materials are housed in the office. Both current students and graduates are encouraged to use the alumni network established for gaining career information and employment contacts.

A resume book is published annually by the school and distributed nationally to potential employers. Students are encouraged to prepare and submit resumes, with the assistance of the professional staff, for publication. Employer response to the resume book has been favorable, and many students have received initial contacts and invitations to interviews as a result.

The career services office also invites representatives from a number of firms and government agencies from throughout the country to visit the school to interview students for internships and permanent positions. Students are strongly urged to begin formulating their job-hunting strategies and implementing the job search early in the second year of study.



**Employment Offers.** The success experienced by degree candidates in securing employment serves as a strong testimony to the value of graduate/professional study at Duke. Students are advised to gear their education to a specialized area in order to increase their marketability. Toward this goal, every effort is made to assist each student in securing a paid summer internship appropriate to his or her field of study and geographic preference. Summer opportunities with local organizations may be continued as part-time positions during the student's second year of study, adding to the base of professional experience.

Beginning salaries vary, depending upon the educational specialization, capabilities, and prior experience of the candidate as well as the type of organization and geographical region in which he or she is employed. For recent graduating classes, beginning salaries have ranged from \$24,000 to \$50,000 annually with candidates having some prior experience and/or advanced quantitative skills commanding the higher figures. For 1996 graduates the mean salary was \$33,700.

Graduates of the school have an excellent record of finding challenging, satisfying employment within their areas of interest. A large percentage of recent graduates have accepted positions with industry and environmental consulting firms. Others work with government agencies, nonprofit organizations, and international development organizations. A few graduates pursue additional degrees.

The market for natural resource managers is strong for our graduates, yet competitive. In both the private sector, where environmental divisions are being established within traditional corporations, and in the public sector, where policy-making bodies increasingly face environmental concerns. Environment graduates are prepared through focused study, research and career-related experience for positions in management, consulting, research, policy and planning, and technical applications. To a



smaller degree, international organizations utilize natural resource managers; students interested in international employment usually benefit from experience such as that gained through the Peace Corps.

## A Broad Horizon

The variety of organizations that employ Nicholas School of the Environment graduates demonstrates the breadth of training in natural resources and the environment available at Duke. The following is a list of selected employers of 1993 to 1996 graduates.

|                                       |  |
|---------------------------------------|--|
| Consulting Firms                      | State/Local Government   |
| ABB Environmental Services            | California Resources Agency  |
| ABT Associates                        | Florida Game and Fish Commission   |
| Arthur Andersen                       | Maine Department of Planning   |
| Blasland, Bouck & Lee                 | Montana Forest Service   |
| Cadmus Group                          | North Carolina Department of Environment,<br>Health and Natural Resources        |
| Camp Dresser & McKee                  | North Carolina Coastal Management Division                                       |
| Dames & Moore                         | South Carolina Water Resources Board   |
| ENSR Consulting & Engineering         | Texas Parks and Wildlife Department  |
| ENVIRON                               | Not-for-Profit/Non-Governmental<br>Organizations/Private Volunteer Organizations |
| ERM, Inc.                             | Chesapeake Bay Foundation  |
| Geraghty & Miller                     | Chesapeake Research Consortium   |
| ICF Kaiser International              | Conservation Law Foundation  |
| Industrial Economics                  | Ford Foundation  |
| Larson & McGowin Consulting Foresters | Freshwater Institute   |
| McLaren/Hart ChemRisk                 | Inform, Inc.   |
| Project Performance Corporation       | InterAmerican Development Bank   |
| Radian Corporation                    | National Wildlife Federation   |
| Roy F. Weston                         | Natural Resource Defense Council   |
| SAIC                                  | Organization of American States  |
| TetraTech, Inc.                       | USAID  |
| Industry                              | US Peace Corps   |
| Duke Energy                           | Rain Forest Alliance   |
| Ernst & Young                         | Research Triangle Institute  |
| E.I. duPont de Nemours                | The Nature Conservancy   |
| General Motors                        | World Resources Institute  |
| Hancock Timber Resources              | Worldwatch   |
| IBM                                   | World Wildlife Fund  |
| International Paper Company           |  |
| Merck & Company                       |  |
| Procter & Gamble                      |  |
| Shacklee Corporation                  |  |
| Southern Natural Gas Company          |  |
| Sprint Mid-Atlantic                   |  |
| Texaco, Inc.                          |  |
| Westvaco Corporation                  |  |
| Xerox                                 |  |
| Federal Government                    |  |
| National Marine Fisheries             |  |
| National Park Service                 |  |
| US Army Corps of Engineers            |  |
| USDA Economic Research Service        |  |
| USDA Forest Service                   |  |
| US Department of Defense              |  |
| US Department of Energy               |  |
| USEPA                                 |  |

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*Student Life*



## Housing

While limited housing is available on campus, most students in the Nicholas School of the Environment join the annual scramble to find a place to live off campus. The university is very much a part of the urban environment that is Durham, but the campus is not an urban one. It is not traversed by streets with housing and businesses. Consequently the perimeter of the West Campus is densely developed with apartment complexes, and the East Campus is adjacent to a neighborhood of large, early twentieth-century homes, some of which have been converted to apartments. Free bus service is available between the two campuses.

The Department of Housing Management operates an off-campus housing service which consists of a staff person who maintains listings of apartment openings, house rentals, and roommates wanted. The off-campus housing service does not rate the quality of apartments, houses, or landlords, nor arrange viewings. However, a student maintained web site at [www.duke.edu/web/n-watch](http://www.duke.edu/web/n-watch) does provide this type of information. Similarly, the Office of Enrollment Services in the Nicholas School of the Environment maintains a listing of houses and apartments popular with students in the school as well as a list of entering students who are interested in finding roommates. These lists are mailed to students during the summer.

## Services for Students

**Communications.** Upon entrance to the Nicholas School, students are issued an Email address. Email is recognized as an official means of communication within the University. Students are encouraged to check their Email frequently.

**Medical Care.** The main components of the student health service include the University Health Services Clinic, located in the Pickens Building on West Campus, and the student infirmary in Duke Hospital South. Emergency transportation, if required, can be obtained from the Duke campus police. The facilities of the university health services clinic are available during both regular and summer sessions. The facilities of the student infirmary are available only from the opening of the university in the fall until graduation day in the spring.

The student health fee is nonrefundable after the first day of classes. Students may be covered during the summer for an additional charge. Dependents and family members are not covered at any time.

The resources of the Medical Center are available to all students and their spouses and children. Charges for all services received from the Medical Center are the responsibility of the student.





The university has an Accident and Sickness Insurance Plan available for full-time students. Although participation in this plan is voluntary, the university expects all graduate students to be financially responsible for medical expenses above those covered by the student health service. Students who have medical insurance or wish to accept the financial responsibility for any medical expense may elect not to join the Accident and Sickness Insurance Plan by signing a statement to this effect. Each full-time student in residence must purchase this student health insurance or indicate the alternative arrangement.

The Student Accident and Sickness Insurance Plan provides protection twenty-four hours a day during the twelve-month term of the policy. Students are covered on and off the campus, at home, while traveling, and during interim vacation periods. For additional fees a student may obtain coverage for a spouse or spouse and children. Term of the policy is from opening day in the fall.

Coverage and services are subject to change as deemed necessary by the university.

**Counseling and Psychological Services.** CAPS provides a comprehensive range of counseling and psychological services to assist and promote the personal growth and development of Duke students. The professional staff is composed of clinical social workers, psychologists, and psychiatrists experienced in working with young adults. Among services provided are personal, social, and academic counseling. A number of short-term seminars or groups focusing on skills development and special interests such as coping with stress and tension, fostering assertiveness, enriching couples' communication, and dealing with separation and divorce are also offered. A policy of strict confidentiality is maintained concerning each student's contact with the CAPS staff. Individual evaluation and brief counseling/therapy as well as skills development seminars are covered by student health fees. There are no additional charges to the student for these services.

Appointments may be made by calling 660-1000 or visiting CAPS, 214 Page.

**Career Development Center.** The Career Development Center, located in Page Building on West Campus, offers a number of integrated services that address a range of student needs from indecision about career choices to assistance with the post-graduate job search. Although many of the services are designed primarily for undergraduates, graduate and professional students are also encouraged to register with the center and use its resources as their career plans evolve.

Students who are unsure of their career plans can obtain confidential counseling to help them better understand themselves and clarify career goals. Individual appointments with counselors are available, as are group workshops, testing, and computerized career guidance programs.

The Career Resources Library, 217 Page, has resources to help students choose careers or further training and education, as well as self-help materials for improving study techniques, time management, test-taking and reading comprehension.

The Office of Placement Services, 110 Page, serves as a liaison between Duke students and potential employers. Services offered include placement seminars and workshops, on-campus interviewing opportunities with employers and graduate/professional schools, position vacancy notices, a library of employer resources, and individualized placement counseling. To participate in job interviews scheduled throughout the year, students must be registered with the office and have assembled a permanent file.

In addition, the school maintains its own Office of Career Services. For further information, see the Career Planning and Placement section in this bulletin.

**International Adviser.** The International Office handles governmental matters for students from abroad such as statements of attendance for home governments, issuance of United States immigration forms for re-entry into the country after a temporary absence, and required yearly extensions of time. Any new student who is not a citizen

of the United States should report with passport to the international adviser soon after arrival. The International Office is located at 300 Alexander Avenue.

**Other Services.** The Bryan University Center houses an information desk, two drama theaters, a film theater, stores for books and supplies, meeting rooms, lounges, snack bars, and other facilities. A barbershop, hairdresser, post office, and bank are also located in the center and in the nearby West Campus Union.

## Student Organizations and Activities

**Sports.** Students are welcome to use such recreational facilities as the swimming pools, tennis courts, golf course, track, jogging course, handball and squash courts, gymnasias, weight room, and playing fields. Intramural programs provide an opportunity to participate in informal and competitive physical activity. A variety of clubs for gymnastics, scuba diving, sailing, cycling, badminton, karate, rugby, soccer, and crew are also active.

**FOREM Club.** The FOREM Club is the student organization for coordination of the school's social functions, community service, and intramural team participation. FOREM is an acronym for Forestry and Environmental Management. Annual functions of the club include a Christmas party, Christmas tree sale, Field Day, and year-end banquet.

**Student Advisory Committee.** The Student Advisory Committee, an elected student group in the Nicholas School of the Environment, meets regularly with the dean and faculty representatives to discuss courses and curriculum, programs, and long-range goals of the school.

**Graduate and Professional Student Council.** The Graduate and Professional Student Council is the university-wide representative body for students registered in the various professional schools and departments of the Graduate School. The council provides a means of communication among graduate students, presents graduate student concerns to the administration, and selects students for membership on university committees. Representatives from the Nicholas School of the Environment are elected annually by the student body.

**Professional and Scientific Societies.** Students are encouraged to participate in one or more professional or learned societies appropriate to their academic interest. Many of these societies are interested in participation by students and offer a lower fee to encourage student membership. Student chapters of the Society of American Foresters, International Society of Tropical Foresters, National Association of Environmental Professionals, and the American Water Resources Association are active in the school.

**Religious Services.** Interdenominational services are conducted on Sunday mornings in Duke Chapel. Roman Catholic masses are offered daily on campus. Several Protestant denominations have student centers on campus. The Divinity School conducts other chapel services and religious and social activities. There is also a Hillel group which meets regularly.

**Cultural Activities.** Concerts, recitals, lectures, plays, films, and dance programs are presented frequently on campus. Information on major events is available at Page Box Office or the Bryan Center information desk. The University Museum of Art, which has some excellent permanent collections, is located on East Campus.

**Harassment Policy.** Harassment of any kind is not acceptable in the Nicholas School of the Environment or at Duke University. It is inconsistent with the University's commitments to excellence and to respect for all individuals. Duke University is committed to the free and vigorous discussion of ideas and issues, which the University believes will be protected by its harassment policy.



Harassment is described by Duke University as the creation of a hostile or intimidating environment, in which verbal or physical conduct, because of its severity and/or persistence, is likely to interfere significantly with an individual's work or education, or affect adversely an individual's living conditions on campus. Sexual coercion is a form of harassment with specific distinguishing characteristics. It consists of unwelcome sexual advances, requests for sexual favors or other verbal or physical conduct of a sexual nature when submission to such conduct is made either implicitly or explicitly a term or condition of employment; or submission to or rejection of such conduct by an individual is used as the basis for employment or educational decisions affecting the individual.

Members of the Nicholas School of the Environment community who have questions about the policy or how to deal with a suspected violation can obtain a copy of the policy and options for resolution from Bertie Belvin (room A142 LSRC) who serves as Harassment Prevention Coordinator for the school or from the Office of the Vice President for Institutional Equity, room 0044 Bryan Center.

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## *Courses of Instruction*



Course offerings are subject to change. The student should consult the current university course schedule for listings of courses to be offered each semester.

## Environment General Courses

**200. Integrated Case Studies.** A group of two to four students may plan and conduct integrated research projects on a special topic, not normally covered by courses or seminars. A request to establish such a project should be addressed to the case studies director with an outline of the objectives and methods of study and a plan for presentation of the results to the school. Each participant's adviser will designate the units to be earned (up to six units) and evaluate and grade the work. Variable credit. *Staff*

**201. Forest Resources Field Skills.** Introduction to field techniques commonly used to quantify and sample forest resources: trees, soils, water, and animal resources. Dendrology, vegetation sampling, soil mapping, river flow estimation, field water quality sampling, surveying, and use of compass. 2 units. *Richter*

**204. Forest Vegetation Measurement.** Measurement of land and forests for purposes of management, appraisal, purchase, and sale. Techniques for predicting the growth and future yield of stands by various methods. 3 units. *Staff*

**205. Ecological Management of Forest Systems (Silviculture).** The aim of the course is to equip future resource managers and environmental consultants with knowledge allowing them to propose lower impact practices to individuals and organizations who need to balance wood production with maintenance of environmental quality. Underlying principles of growth, from seed to mature trees, and stand dynamics are explored. Various alternative methods of manipulating growth, stand structure and development, ranging from little to large perturbations of forest systems, are presented and assessed in terms of their effect on resource quality. 3 units. *Oren*

**205L. Ecological Management of Forest Systems (Silviculture).** Same as 205 with laboratory. 4 units. *Oren*



**207. Forest Pest Management.** Fundamentals of entomology and plant pathology as appropriate to understanding the impacts of insects and diseases on forest productivity and their assessment for integration into forest management. Regional case examples and complexes are evaluated in terms of pest-population, forest-stand dynamics; economic and societal constraints; treatment strategies; monitoring systems; and benefit-cost analysis. This approach seeks to develop predictive capabilities in long-range pest management and decision making. 3 units. *Stambaugh*

**207L. Forest Pest Management.** Same as 207 with laboratory which is largely field oriented to focus on diagnostics and impact analysis. 4 units. *Stambaugh*

**208L. Estuarine Ecosystem Processes.** A study of the physical, chemical, and biological processes that control the structure of estuarine communities. Emphasis on field and laboratory techniques and data interpretation. (Given at Beaufort.) Prerequisite: ecology, systematics, or field biology course or consent of instructor. C-L: Marine Sciences. 4 units. *Kirby-Smith*

**209. Conservation Biology and Policy.** Introduction to the key concepts of ecology and policy relevant to conservation issues at the population to ecosystems level. Focus on the origin and maintenance of biodiversity and conservation applications from both the biology and policy perspectives (for example, endangered species, captive breeding, reserve design, habitat fragmentation, ecosystem restoration/rehabilitation). Lectures and discussions integrate the science and policy issues and focus upon problem solving primarily, although not exclusively, in marine systems. Visiting scholars interact with students and supplement information provided by course faculty. (Given at Beaufort.) Prerequisite: introductory biology; suggested: a policy and/or introductory ecology course. C-L: Marine Sciences. 3 units. *Crowder and Rubenstein*

**212. Environmental Toxicology.** Study of environmental contaminants from a broad perspective encompassing biochemical, ecological, and toxicological principles and methodologies. Discussion of sources, environmental transport and transformation phenomena, accumulation in biota and ecosystems. Impacts at various levels of organization, particularly biochemical and physiological effects. Prerequisites: organic chemistry and vertebrate physiology or consent of instructor. 3 units. *Di Giulio*

**213. Forest Ecosystems.** Emphasis on the processes by which forests circulate, transform, and accumulate energy and materials through interactions of biologic organisms and the forest environment. Ecosystem productivity and cycling of carbon, water, and nutrients provide the basis for lecture and laboratory. 3 units. *Richter*

**214. Landscape Ecology.** Emphasis on the role of spatial heterogeneity in terrestrial systems: its detection and description, agents of pattern formation, landscape dynamics and models, and the implications of heterogeneity of populations, communities, and ecosystems. Prerequisites: an intermediate-level ecology course and the equivalents of Environment 251 and 351, or consent of instructor. 3 units. *Urban*

**215. Environmental Physiology.** Examination of tolerance, limiting factors, nutrition, and other ecological physiology concepts used in evaluating plant responses to multiple environmental stresses. Discussion of procedures for and examples of monitoring physiological responses to environmental perturbations and resource manipulation. 2 units. *Oren*

**216. Applied Population Ecology.** Population dynamics of managed and unmanaged populations. A quantitative approach to exploitation and conservation of animal and plant populations, including harvesting, population viability analysis, population genetics. Prerequisites: introductory statistics, calculus, and computer programming or consent of instructor. 3 units. *Staff*

**217. Tropical Ecology.** Ecosystem, community, and population ecology of tropical plants and animals with application to conservation and sustainable development. Prerequisite: a course in general ecology. C-L: Biology 215, Botany 215, and Zoology 215. 3 units. *Terborgh*

**218L. Barrier Island Ecology.** An integration of barrier island plant and animal ecology within the context of geomorphological change and human disturbance. Topics include: barrier island formation and migration, plant and animal adaptations, species interactions, dune succession, maritime forests, salt marshes, sea level rise, conservation policy, and restoration ecology. Field trips to many of the major North Carolina barrier islands. Strong emphasis on field observation and independent research. (Given at Beaufort.) Prerequisite: Biology 25L or equivalent; suggested: course in botany or ecology. C-L: Biology 218L, Botany 218L, and Marine Sciences. 4 units. *Evans, Peterson, and Wells (visiting summer faculty)*

**219L. Marine Ecology.** Factors that influence the distribution, abundance, and diversity of marine organisms. Course structure integrates lectures, field excursions, and independent research projects. Topics include characteristics of marine habitats, adaptation to environment, species interactions, biogeography, larval recruitment, rocky shores, marine mammals, fouling communities, tidal flats, beaches, subtidal communities, and coral reefs. Open to undergraduates only under Biology 129L. (Given at Beaufort.) Prerequisite: none; suggested—introductory ecology, invertebrate zoology, or marine botany. C-L: Marine Sciences and Zoology 203L. 4 units. *Staff*

**221. Soil Resources.** Emphasis on soil resources as central components of terrestrial ecosystems, as rooting environments for plants, and as porous media for water. Soil physics and chemistry provide the basis for the special problems examined through the course. Laboratory emphasizes field and lab skills, interpretive and analytical. 3 units. *Richter*

**225L. Coastal Ecotoxicology and Pollution.** Principles of transport, fates, food-web dynamics and biological effects of pollutants in the marine environment. Laboratory to stress standard techniques for assessing pollutant levels and effects. (Given at Beaufort.) Prerequisites: introductory chemistry and biology. C-L: Marine Sciences. 4 units. *Kenney*

**226. Marine Mammals.** Ecology, social organization, behavior, acoustic communication, and management issues. Focused on marine mammals in the southeastern United States (for example, bottlenose dolphin, right whale, West Indian manatee). Only open to undergraduates under Biology 126. (Given at Beaufort.) Prerequisite: introductory biology. C-L: Marine Sciences. 3 units. *Read or staff*

**226L. Marine Mammals.** Laboratory version of Environment 226. Laboratory exercises consider social organization and acoustic communication in the local bottlenose dolphin population. (Given at Beaufort.) Prerequisite: introductory biology. C-L: Marine Sciences. 4 units. *Read or staff*

**228L. Physiology of Marine Animals.** Environmental factors, biological rhythms, and behavioral adaptations in the comparative physiology of marine animals. Open to undergraduates only under Biology 150L. Four units (fall); six units (summer). (Given at Beaufort.) Prerequisites: introductory biology and chemistry. C-L: Marine Sciences. Variable credit. *Forward*

**229L. Biochemistry of Marine Animals.** Functional, structural, and evolutionary relationships of biochemical processes of importance to marine organisms. Open to undergraduates only under Biology 155L. Four units (fall and spring); six units (summer). (Given at Beaufort.) Prerequisite: Biology 25L; Chemistry 11L, 12L. C-L: Marine Sciences. Variable credit. *Rittschof*

**230L. Weather and Climate.** Overview of the science of meteorology and principles of climatology, especially as applied to problems in ecology and natural resource management. Emphasis on the processes and characteristics of weather phenomena and local and regional climates. General introduction to sources of climatic data and climatic data analysis. Includes laboratory. 4 units. *Knoerr*

**232. Microclimatology.** Introduction to the micrometeorological processes. Discussion of the integration of these processes and the resulting microclimates in the rural (forest, field, and water surface) and urban environments. Methods for modification of the microclimate. Offered on demand. C-L: Biology 232 and Botany 232. 3 units. *Knoerr*

**234L. Watershed Hydrology.** Introduction to the hydrologic cycle with emphasis on the influence of land use, vegetation, soil types, climate, and land forms on water quantity and quality and methods for control. Development of water balance models. Analysis of precipitation patterns, rainfall and runoff, and nonpoint source impacts. Statistical handling and preparation of hydrologic data, simulation and prediction models, introduction to groundwater flow, laboratory and field sampling methods. 4 units. *Katul*

**235. Air Quality Management.** Types, sources, effects of air pollutants. Regulatory framework emphasizing the Clean Air Act Amendments of 1990 and federal, state, local agency implementation. Application of risk assessment, technology, market incentives to air management. Scientific, policy aspects of acid deposition, global climate change, indoor air, mobile sources control. Dispersion modeling, exposure assessment. 3 units. *Vandenberg*

**236. Water Quality Management.** Types, sources, and effects of pollutants. Water quality standards and criteria. Engineering approaches to water management. Mathematical models and their application to water quality management. Federal regulations, in particular, the Federal Water Pollution Control Act and the Safe Drinking Water Act. Policy analysis for water quality management planning. 3 units. *Stow*

**237. Field Botany of North Carolina's Wetlands.** A survey of the flora of North Carolina's wetland habitats with emphasis on plant identification in the field. Field trips to mountain, piedmont, and coastal wetlands. Examination of all groups of plants including bryophytes, ferns, and seed plants. Wetland habitats include swamps, bogs, pocosins, and brackish sites. Information on the floristics of the southeastern United States botanical nomenclature, systematic relationships of wetland plants, and an overview of wetland vegetation. Prerequisite: one course in plant diversity or systematics, or consent of instructor. C-L: Biology 242 and Botany 242. 3 units. *Shaw and Wilbur*

**239. Human Health and Ecological Risk Assessment.** Topics central to both health and ecological risk assessment are explored. Basic concepts of hazard identification, dose-response relationships, exposure assessment, and risk characterization and communication are discussed in the context of both human health and environmental assessment. The basis and rationale for using specific, as well as extrapolated, scientific information and expert judgment, and the strengths and weaknesses of alternative approaches, are evaluated. Applications emphasizing real cases are used to illustrate the interdisciplinary process and products of risk assessment, as well as the regulatory use of the information. Group projects emphasized. 3 units. *Mihaich and Vandenberg*

**240. Fate of Organic Chemicals in the Aquatic Environment.** Kinetic, equilibrium, and analytical approaches applied to quantitative description of processes affecting the fate of anthropogenic and natural organic compounds in surface and groundwaters and



in selected treatment processes, including sorption phenomena, gas transfer, hydrolysis, photochemistry, oxidation-reduction, and biodegradation. Sampling, detection, identification, and quantification of organic compounds in the environment. Gas and liquid chromatography and mass spectrometry. Prerequisites: university-level general chemistry and organic chemistry within last four years. C-L: Civil Engineering 240. 3 units. *Dubay*

**241. Atmospheric Chemistry and Air Pollution.** Chemical kinetics and equilibrium applied to the mechanistic and quantitative description of processes affecting the fates of anthropogenic and natural chemicals in the troposphere, on local, regional, and global scales. Direct photolysis; gas-phase photo-formation and fates of ozone, radicals, and other oxidants; gas-phase oxidations of volatile organic compounds; gas-to-drop partitioning; aqueous-phase photoformation and fates of hydrogen peroxide, radicals, and other oxidants in the aqueous phases of clouds, fogs, and aerosols; effects of aqueous-phase reactions on the chemical composition of the troposphere; gas-phase and aqueous-phase oxidations of organic and inorganic compounds; stratospheric ozone depletion. Prerequisites: university-level general chemistry and organic chemistry within last four years. C-L: Civil Engineering 241. 3 units. *Staff*

**242. Environmental Aquatic Chemistry.** Principles of chemical kinetics and equilibria applied to quantitative description of the chemistry of lakes, rivers, oceans, groundwaters, and selected treatment processes. Equilibrium, steady state, and other kinetic models applied to processes such as the carbonate system, coordination chemistry, precipitation and dissolution, oxidation-reduction, photochemistry, adsorption, and heterogeneous reactions. Prerequisite: university-level general chemistry within last four years. C-L: Civil Engineering 242. 3 units. *Ahmann*

**243. Environmental Biochemistry.** Introduction to the (macro)molecules of life and fundamental metabolic pathways. Topics are presented in the context of environmental perturbations. Fundamental aspects of energetics, proteins, enzymes, carbohydrates, lipids, and nucleic acids. Emphasis on mechanisms of adaptation, molecular controls, and responses to toxicants. (Given at Beaufort.) Prerequisite: organic chemistry. C-L: Cell Biology 243 and Marine Sciences. 3 units. *C. Bonaventura*

**244L. Molecular and Cellular Processes in Marine Organisms.** Joint research projects on the adverse effects of environmental pollutants on marine organisms at the cellular and molecular level. Research methodologies include: spectroscopy (UV/VIS, fluorescence, and atomic absorption); subcellular fractionation; protein purification and characterization using chromatography and electrophoresis; analysis of pollutant-induced damage to proteins, membranes, and DNA; measurement of activity of enzymatic defense systems. Lectures cover molecular mechanisms of damage and damage control, and concepts that underlie the methods to be used. (Given at Beaufort.) Prerequisite: organic chemistry. C-L: Cell Biology 244L and Marine Sciences. 4 units. *C. Bonaventura and McClellan-Green*

**245. Ecology of Microorganisms.** Factors affecting the abundance, distribution, and behavior of microorganisms. Topics include microbial form and function, activities in the environment, and applications to current environmental issues. 3 units. *Staff*

**246. Survey of Occupational Health and Safety.** Occupational risks associated with biological, chemical, ergonomic, radiation, and toxic hazards. The nature and scope of occupational hazards, health effects, and risk assessment and management strategies. Open to undergraduates by consent. 3 units. *Staff*

**247. Survey of Environmental Health and Safety.** Environmental risks from the perspective of global ecology, biology, chemistry, and radiation. The nature and scope

of environmental hazards, environmental impacts and health effects, and risk assessment and management strategies. Open to undergraduates by consent. 3 units. *Staff*

**248. Solid Waste Engineering.** Engineering design of material and energy recovery systems including traditional and advanced technologies. Sanitary landfills and incineration of solid wastes. Application of systems analysis to collection of municipal refuse. Major design project in solid waste management. Prerequisite: Civil Engineering 124L or consent of instructor. C-L: Civil Engineering 248. 3 units. *Vesilind*

**249. Environmental Molecular Biology.** Introduction to molecular techniques and gene regulation as they apply to environmental issues. Topics include basic cloning strategies and methods, DNA/RNA/protein separation and hybridization, polymerase chain reaction, *in vitro* mutagenesis, and protein expression. Student presentations illustrate how molecular technologies such as the creation of genetically engineered organisms address environmental problems. Prerequisite: introductory biology. 3 units. *Freedman*

**251. Statistics and Data Analysis in Biological Science.** Elements of statistical inference and estimation including exploratory data analysis, regression, and analysis of variance. Emphasis on biological science applications. Not open to students who have had Mathematics 136 or Statistics 110A, 110B, 112, 113, 114, 210A, or 213. C-L: Statistics 210B. 3 units. *Staff*

**255. Applied Regression Analysis.** Linear regression using both graphical and numerical methods. Model construction, critique, and correction using graphical residual analysis. One-way and two-way analysis of variance; introduction to design of experiments. Use of a standard statistical software package. Applications and examples drawn from various sources, emphasizing the biological and environmental sciences. Prerequisite: Statistics 210B or equivalent. C-L: Statistics 242. 3 units. *Staff*

**256S. Seminar in Ocean Sciences.** Biological, chemical, physical, and geological aspects of the ocean and their relation to environmental issues. Consent of instructor required. (Given at Beaufort.) C-L: Marine Sciences. 2 units. *Staff*

**260. Western Field Trip.** One-week trip to observe land management and utilization practices in the western United States. Exposure to ecological, economic, and policy issues, as well as watershed, wildlife, and land use questions. Consent of instructor required. 1 unit. *Staff*

**262. Forest Utilization Field Trip.** Introduction to utilization in the managed forest and the principal wood-using industries. Taught as a one-week field seminar. May be taken by nonforestry majors. 1 unit. *Richter*

**263. Environmental Economics: Theory and Application.** Role of materials and energy balances in modeling production and consumption; externalities and Pigouvian taxes; property rights and open access resources; role of market structure; design of policy instruments and actual practice; contrasts between domestic and international environmental policies. Prerequisite: Economics 149. C-L: Economics 263. 3 units. *Smith*

**264. Applied Differential Equations in Environmental Sciences.** General calculus and analytic geometry review; numerical differentiation and integration; analytic and exact methods for first and second order ordinary differential equations (ODE); introduction to higher order linear ODE, numerical integration of ODEs and systems of ODEs; extension of Euler's method to partial differential equations (PDE) with special emphasis on parabolic PDE. Example applications include population forecasting, soil-plant-atmosphere water flow models, ground water and heat flow in soils, and diffusion

of gases from leaves into the atmosphere. Prerequisite: Mathematics 31 or equivalent or consent of instructor. 2 units. *Katul*

**266. Ecology of Southern Appalachian Forests.** Field trips to various forest ecosystems in the southern Appalachian Mountains. Species identification, major forest types, field sampling, and history of effects of human activities. Consent of instructor required. 1 unit. *Richter*

**269S. Advanced Topics in Marine Ecology.** Theoretical concepts from population, community, and evolutionary ecology will be linked to observations and experiments to enhance understanding of the structure and function of marine systems. Current topics in marine ecology (for example, marine food web dynamics, species interactions, life history strategies, fisheries ecology, conservation biology). Discussions will be based on readings from the primary literature with emphasis on developing critical and synthetic skills. Each student will prepare a research proposal in NSF format. May be repeated. (Given at Beaufort.) C-L: Marine Sciences and Zoology 264S. 2 units. *Crowder*

**270. Resource and Environmental Economics.** The application of economic concepts to private- and public-sector decision making concerning natural and environmental resources. Intertemporal resource allocation, benefit-cost analysis, valuation of environmental goods and policy concepts. Prerequisite: introductory course in microeconomics. C-L: Economics 270 and Public Policy Studies 272. 3 units. *Kramer*

**271. Economic Analysis of Resource and Environmental Policies.** Case and applications oriented course examining current environmental and resource policy issues. Benefits and costs of policies related to sustaining resource productivity and maintaining environmental quality will be analyzed using economic and econometric methods. Topics include benefit-cost analysis, intergenerational equity, externalities, public goods, and property rights. Prerequisite: Environment 270 or equivalent; Economics 149 recommended. C-L: Economics 272. 3 units. *Mansfield*

**272. Evaluation of Public Expenditures.** Basic development of cost benefit analysis from alternative points of view, for example, equity debt, and economy as a whole. Techniques include: construction of cash flows, alternative investment rules, inflation adjustments, optimal timing and duration of projects, private and social pricing. Adjustments for economic distortions, foreign exchange adjustments, risk and income distribution examined in the context of present value rules. Examples and cases from both developed and developing countries. C-L: Economics 261 and Public Policy Studies 261. 3 units. *Conrad*

**273. Marine Fisheries Policy.** Principles, structure, and process of public policy-making for marine fisheries. Topics include local, regional, national, and international approaches to the management of marine fisheries. A social systems approach is used to analyze the biological, ecological, social, and economic aspects of the policy and management process. (Given at Beaufort.) C-L: Marine Sciences. 3 units. *Orbach*

**274. Resource and Environmental Policy.** Development of a policy analysis framework for studying resource and environmental policy. Political institutions, interest group theory, public choice theory, role of economics in policy analysis, ethics and values. Application to current and historical U.S. policy issues. Prerequisite: Environment 270, Public Policy Studies 272, or consent of instructor. C-L: Public Policy Studies 274. 3 units. *Lober*

**276. Marine Policy.** Formal study of policy and policy-making concerning the coastal marine environment. History of specific marine-related organizations, legislation, and issues and their effects on local, regional, national, and international



arenas. Topics explored through use of theoretical and methodological perspectives, including political science, sociology, and economics. Consent of instructor required. (Given at Beaufort.) C-L: Marine Sciences and Public Policy Studies 197. 3 units. *Orbach*

**277. Conservation and Sustainable Development I: Concepts and Methods.** Agronomic, ecological, and economic concepts of sustainability, with emphasis on application in developing countries; forest, soil, and wildlife resources; models in conservation biology; historical, cultural, and sociological perspectives; policy analysis. 3 units. *Staff*

**278. Conservation and Sustainable Development II: Integrated Problem Solving.** Approaches to reconciling conservation and development, with emphasis on developing countries. Case studies; project formulation, implementation, and evaluation; institutional policy formation; conflict resolution. 3 units. *Staff*

**280. Social Science Surveys for Environmental Management.** Social science research methods for collecting data for environmental management and policy analysis. Sampling, survey design, focus groups, pretesting, survey implementation, coding, and data analysis. Team projects emphasize development and practice of survey skills. Prerequisite: Environment 251 or equivalent. 3 units. *Kramer*

**282S. Environmental Ethics.** Selected topics involving values and the environment, for example, extending morality to nature, rights of future generations, environmental aesthetics, diversity and stability, ideological biases in ecological knowledge. Consent of instructor required. C-L: Philosophy 289S. 3 units. *Cooper*

**283. Corporate Environmental Management and Strategy.** Examines management theories, frameworks, tools, and concepts which can be used to gain the value-added from environmental performance. The course is organized around three themes: competitive aspects of environmental performance; management systems, tools, and approaches to integrate business and the environment; and environmental stakeholder management. C-L: Business Administration 435. 3 units. *Lober*

**285. Land Use Principles and Policy.** Consideration of four major roles of land in the United States: as a producer of commodities, financial asset, component of environmental systems, and location of development. Analysis of market allocation of land, market failure, role of public planning and regulation. C-L: Public Policy Studies 285. 3 units. *Healy*

**290. Physical Oceanography.** Introduction to the dynamic principles of ocean circulation with an emphasis on large temporal and spatial scales of motion. Topics include wind-driven and density-driven flow, western boundary intensification, mid-ocean, shelf, and tropical circulations. Prerequisites: Mathematics 31 and 32 or consent of instructor. C-L: Geology 203 and Mechanical Engineering 290. 3 units. *Lozier*

**291. Geological Oceanography.** The geology of ocean basins, including origin, bottom physiography, sediment distribution, and sedimentary processes. Not open to students who have taken Geology 206S. (Given at Beaufort.) C-L: Geology 205 and Marine Sciences. 3 units. *Staff*

**292L. Biological Oceanography.** Physical, chemical, and biological processes of the oceans, emphasizing special adaptations for life in the sea and factors controlling distribution and abundance of organisms. Only open to undergraduates under Biology 114L. Four units (spring); six units (summer). (Given at Beaufort and Bermuda.) Prerequisite: introductory biology. C-L: Marine Sciences. Variable credit. *Ramus or staff (Beaufort); Nelson and Steinberg (Bermuda)*

**293. Analysis of Ocean Ecosystems.** The history, utility, and heuristic value of the ecosystem; ocean systems in the context of Odum's ecosystem concept; structure and function of the earth's major ecosystems. Open to undergraduates only under Biology 123. (Given at Beaufort.) Prerequisite: one year of biology, one year of chemistry, or consent of instructor. C-L: Marine Sciences. 3 units. *Barber*

**295L. Marine Invertebrate Zoology.** Structure, function, and development of invertebrates collected from estuarine and marine habitats. Not open to students who have taken Biology or Zoology 274L. Open to undergraduates only under Biology 176L. Four units (fall and Summer Term II); six units (Summer Term I). (Given at Beaufort.) Prerequisite: introductory biology. C-L: Marine Sciences. Variable credit. *Dimock (visiting summer faculty) or Kirby-Smith (environment)*

**298. Special Topics.** Content to be determined each semester. May be repeated. Variable credit. *Staff*

**299. Independent Studies and Projects.** Directed readings or research at the graduate level to meet the needs of individual students. Consent of instructor required. Units to be arranged. Variable credit. *Staff*

**303. Principles of Ecological Modeling.** Design, implementation, analysis, and interpretation of ecological models. Combination of lectures, student-moderated discussions, and computer lab exercises. Prerequisites: Biology 110L or equivalent and Environment 251 or equivalent. C-L: Botany 303. 3 units. *Reynolds and Urban*

**307. Ecophysiology of Productivity and Stress.** Exploration of principles governing stand growth and its response to a variety of stresses. Emphasis on climate, soil resources, and competition. Stresses and their reliefs determined by pollution and the availability of resources as modifiers of the physiological properties of trees. 3 units. *Oren*

**312. Wetlands Ecology and Management.** The study of bogs, fens, marshes, and swamps. Emphasis on processes within the ecosystem: biogeochemical cycling, decomposition, hydrology, and primary productivity. Ecosystem structure, the response of these systems to perturbations, and management strategies are discussed. A research project is required. Prerequisites: one course in ecology and chemistry. 3 units. *Richardson*

**313. Advanced Topics in Environmental Toxicology.** Discussion of current issues. Topics vary but may include chemical carcinogenesis in aquatic animals; biomarkers for exposure and sublethal stress in plants and animals; techniques for ecological hazard assessments; and means of determining population, community, and ecosystem level effects. Lectures and discussions led by instructor, guest speakers, and students. Prerequisite: Environment 212. 3 units. *Di Giulio*

**314. Integrated Case Studies in Toxicology.** Students are assigned topics relative to their chosen research discipline in toxicology and are asked to develop case studies to present at a roundtable workshop. Emphasis on review and analysis of toxicological problems from a holistic (multidisciplinary) viewpoint. Offered on demand. C-L: Pharmacology 314. 1 unit. *Abou-Donia*

**315. Focused Topics in Toxicology.** A contemporary advanced toxicology research area covered with readings from the current primary literature. An integrative review of the topic prepared as a collaborative effort. Consent of instructor required. Prerequisites: Pharmacology 233 and 347. C-L: Pharmacology 315. 1 unit. *Levin*

**316. Case Studies in Environmental and Forest Management.** Drawing on their previous course work, students will analyze environmental problems from ecological,

economic, ethical, and sociopolitical perspectives. Students work in teams to (1) research and present to the class reviews of selected topics in environmental problem solving, and (2) develop and analyze management alternatives for local environmental problems. The teams present their projects in written and oral form. Prerequisite: second-year graduate/professional; ecology or forestry, economics, quantitative methods; or consent of instructor. 4 units. *Maguire*

**317. Topics in Tropical Ecology and Conservation.** Discussion of current issues and ideas at the interface between basic and applied science. Lectures, seminars, and discussion with student participation. Prerequisite: Environment 217 or equivalent. 2 units. *Terborgh*

**330L. Environmental Monitoring and Instrumentation.** Methods of measuring and monitoring the earth's physical environment with emphasis on water and air resources. Characteristics and uses of contemporary sensors, measurement and data acquisition systems. Methods of obtaining and processing computer compatible data records. Includes laboratory. Offered on demand. C-L: Botany 330L. 4 units. *Knoerr*

**335. Water Quality Modeling.** Development and evaluation of simulation models of surface water quality. Mechanistic descriptions of aquatic ecosystems and materials transport. Statistical methods for monitoring design and trend detection. Uncertainty analysis. Prerequisites: Environment 236 and 350. 2 units. *Reckhow*

**340. Biohazard Science.** Philosophy of safety; etiology, infectivity, and transmissibility of disease; immunity and resistance; occupational and nosocomial infections; aerobiology; biotechnology; disinfection and sterilization; biocontainment and facility design; and safety management. Prerequisite: general microbiology or consent of instructor. 3 units. *Tulis*

**341L. Methods in Biohazard Science.** Fundamentals of disinfection, sterilization, and biocidal materials methodology, inactivation kinetics and dosimetry; medical waste management; mutagenicity, pyrogenicity, and PCR testing; laminar flow cabinet certification; microbiologic surface and air sampling; respirator assessment; laboratory audits and regulatory compliance. Prerequisite: Environment 340 or consent of instructor. 4 units. *Staff*

**342. Bioaerosols.** Principles of aerobiology; sick-building syndrome and building-related illness; ventilation, filtration, and humidification systems; chemical and biological pollutants; health effects; sampling and assessment of bioaerosols; remediation measures; handling indoor air quality perceptions. Consent of instructor required. 2 units. *Thomann and Tulis*

**343. Hazard Management, Law, and Ethics.** Economics and ecology; survey of federal and state laws; legal basis for regulation; enforcement, including inspections and audits, permits and licensing, and citations, injunctions, and penalties; management accountability; ethics in science and medicine; risk assessment and management; policy development and implementation. Consent of instructor required. 3 units. *Warren*

**351. Computer-Based Map Analysis with Geographic Information Systems.** Introduction to computer-based map analysis systems (geographic information systems). Use of map algebra in computer analyses of spatially distributed map information. Applications in analyzing and solving natural resource management problems. 3 units. *Halpin*

**352. Spatial Analysis in Ecology.** Techniques of spatial analysis as applied to ecological data, including scaling techniques, pattern analysis, indices of patchiness



(adjacency, contagion), and inferential methods (cross-correlation, permutation procedures). Emphasis on hands-on applications in computer lab. Prerequisite: Environment 214 or consent of instructor. 3 units. *Urban*

**353. Advanced Topics in Landscape Ecology.** Small groups of students working together to complete a project in landscape analysis integrating remote sensing, geographic information systems, spatial analysis, and simulation modeling. Expectation is that each student will have experience in at least one of these areas. Consent of instructor required. Offered on demand. 3 units. *Halpin and Urban*

**354. GIS Analysis for Conservation Management.** This course explores applications of geographic and spatial analysis to conservation management issues such as habitat analysis, biodiversity protection assessments, and nature reserve design. The primary goals of the course are: (1) to critically assess the theoretical underpinnings of conservation analysis techniques; and (2) to develop a high level of proficiency in the application of geographic and spatial analysis techniques for conservation management problems. Prior experience with GIS systems and consent of instructor required. 3 units. *Halpin and Urban*

**356. Environmental Fluid Mechanics.** Introduction to turbulent fluid flow and Navier Stokes equations; basic concepts in statistical fluid mechanics; development of prognostic equations for turbulent fluxes, variances, and turbulent kinetic energy; Monin and Obukhov similarity theory for stratified turbulent boundary layer flows; applications to CO<sub>2</sub>, water vapor, and heat fluxes from uniform and nonuniform surfaces; the local structure of turbulence and Kolmogorov's theory; turbulent energy transfer and energy cascade between scales; turbulence measurements in the natural environment. Prerequisite: Civil Engineering 122L, Mathematics 111 or 135, or equivalent. 3 units. *Katul*

**357. Satellite Remote Sensing for Environmental Analysis.** Environmental analysis using satellite remote sensing. Theoretical and technical underpinnings of remote sensing (multi-spectral image analysis, classification, and georectification) coupled with practical applications (land cover mapping, change analysis, ground truth techniques). Strong emphasis on hands-on processing and analysis of satellite and digital photogrammetric imagery in a UNIX workstation environment. Consent of instructor required. 3 units. *Halpin*

**363. Economics of Natural Resource Damage Assessment.** Topics vary each semester offered. C-L: Economics 363. 3 units. *Smith*

**372. Advanced Theory of Environmental and Natural Resource Economics.** The application of economic concepts to private- and public-sector decision making concerning natural and environmental resources. Topics include modeling externalities and public goods, design of policy instruments, management of renewable and nonrenewable resources, welfare theory and valuation methods, and environmental risk. Prerequisites: Economics 301 and 302 or consent of instructor. C-L: Economics 372. 3 units. *Mansfield and Smith*

**373. Topics in Environmental and Natural Resource Economics.** Examination of current research in environmental and natural resource economics, building on the theory of environmental and natural resource economics developed in Economics/Environment 372. Includes selected topics from Economics/Environment 372 and other quantitative and theoretical issues pertinent to prevailing research in environmental economics. Prerequisite: Economics/Environment 372 or consent of instructor. C-L: Economics 373. 3 units. *Mansfield and Smith*

**385. Environmental Decision Analysis.** Quantitative methods for analyzing environmental problems involving uncertainty and multiple, conflicting objectives. Topics include subjective probability, utility, value of information, multiattribute methods. Students will apply these tools to an environmental policy decision in a group project. Prerequisite: Environment 251 or equivalent. 3 units. *Maguire*

**388. Seminar in Resource and Environmental Policy.** Discussion of the political, legal, and socioeconomic aspects of public and private action in environmental quality control and management. Consent of instructor required. Variable credit. *Staff*

**389. Seminar in Conservation and Environmental History.** Traces the evolution of conservation and environmental movements and the development of environmental ethics. History of agencies, industries, associations, and citizen groups as well as overall policies for land and resources. Comparison of parallel developments in Canada. Consent of instructor required. C-L: History 389. 3 units. *Steen*

**394. Professional and Field Skills.** A series of modules offered on a rotating basis over the four semesters of a professional master's program. Modules consist of one to twenty hours of instruction in a skill needed for professional development or competence in field sampling or laboratory techniques. Examples of topics include environmental negotiation; environmental safety; use of computer packages; preparing presentations and written reports; sampling design; field sampling of trees, herbaceous plants, streambottom organisms; toxicological testing using plankton. Variable credit. *Maguire*

**398. Program Area Seminar.** Required seminar in each program area. Students present master's project research. Pass/fail grading only. 1 unit. *Staff*

**399. Master's Project.** An applied study of a forestry or environmental management problem or a theoretical research effort. A seminar presentation of the objectives, methodology, and preliminary findings is required. A written (or other medium) report at the conclusion of the project is also required. Undertaken with the guidance of the student's adviser. Consent of instructor required. Pass/fail grading only. Variable credit. *Staff*

## Environment Intensive Courses

**258. Forest Appraisal.** Presentation of the principles of real estate appraisal as they apply to valuation problems in forestry. Consideration of appraisal theory, accounting and tax concepts in forest land management. Application of financial analysis techniques to forest land management through lectures and problem-solving sessions. Intensive. Variable credit. *Burak*

**281. Environmental Law.** Examination of contemporary environmental law and its common law antecedents in the context of the American legal system. Objectives are to provide basic training in analyzing cases and statutes, applying knowledge in a classroom setting, and using a law library. Intensive. Offered on demand. 1 unit. *M. Heath*

**286. Land Conservation Strategies.** Knowledge, information, and identification of available resources to enable a volunteer or experienced professional to complete a land acquisition for conservation purposes. Consent of instructor required. Intensive. 1 unit. *Staff*

**288. Medicine for the Third World Traveler.** Basic medical skills for participants in research and exploration in underdeveloped countries. Overview of health concerns; food and water-borne diseases; vector-borne, parasitic, and other infections; trauma

and skin problems; and resources and preparation for travel. Hands-on experience offered where needed. Consent of instructor required. Intensive. 1 unit. *Maeyens*

**311. Identification and Delineation of Jurisdictional Wetlands.** Course combines both classroom lectures and field exercises covering soil chemistry, soil taxonomy, hydric soil indicators, Munsell color charts, hydrophytic plant communities, wetland hydrology, use and interpretation of the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual, and field measurements techniques. Primary emphasis on field identification and jurisdictional wetlands. Consent of instructor required. Intensive. 1 unit. *Faulkner and Richardson*

**318. New Advances in Ecological Risk Assessment.** Overview of ecological risk assessment; demonstration of risk assessment of toxic chemicals to the ecological environment. Emphasis on aquatic environments through discussions and examples; case-study applications. Consent of instructor required. Intensive. 1 unit. *Di Giulio, Parkhurst, and Warren-Hicks*

**380. Translating Ideas and Concepts into Implementable Environment and Natural Resources Management Projects.** Applied course using an interdisciplinary and multisectoral approach focusing on project identification, proposal writing, preparation, project component definition, implementation, and sustainability, including economic analysis incorporating social, economic, and environmental benefits and costs. Basic concepts and principles drawn from these sciences will be used to define problems, examine options, and develop solutions. Intensive. 1 unit. *Sharma*

**386. Implementation of the National Environmental Policy Act on Federal Lands and Facilities.** Overview of NEPA content, case law, and current issues. Discussion of methods of implementing regulations, conducting and processing an environmental impact analysis, determining the proper level of documentation to fully record and disclose results. Intensive. 1 unit. *Clark*

**387. Preparing and Documenting Environmental Impact Analyses.** Principles of how to acquire, assemble, analyze, and present in document form, information required by the National Environmental Policy Act. Extensive practical exercises designed to make use of realistic case study materials provided by students. Consent of program director required. Intensive. 1 unit. *Magness*

## ENVIRONMENT COURSES CURRENTLY UNSCHEDULED

222L. Physical Processes in Coastal Environments

223L. Behavioral Ecology

252L. Statistics and Data Analysis in Earth and Ocean Science

267S. Conservation Biology of Marine Mammals

268. Advanced Topics in Nearshore Processes

297L. Biology of Marine Invertebrates

## Geology Courses

Information about below 200-level Geology courses can be found in the *Duke University Bulletin of Undergraduate Instruction*.

**200. Beach and Coastal Processes.** The study of sedimentary processes and geomorphology of nearshore environments with emphasis on both developed and undeveloped barrier island systems. 3 units. *Pilkey*

**203. Physical Oceanography.** Introduction to the dynamic principles of ocean circulation with an emphasis on large temporal and spatial scales of motion. Topics include wind-driven and density-driven flow, western boundary intensification, mid-



ocean, shelf, and tropical circulations. Prerequisites: Mathematics 31 and 32 or consent of instructor. C-L: Environment 290 and Mechanical Engineering 290. 3 units. *Lozier*

**205. Geological Oceanography.** The geology of ocean basins, including origin, bottom physiography, sediment distribution, and sedimentary processes. Not open to students who have taken Geology 206S. (Given at Beaufort.) C-L: Environment 291 and Marine Sciences. 3 units. *Staff*

**208S. Paleoceanography.** Geology, paleoceanography, and evolution of the oceans, ocean basins, and marine biota based on analysis of deep-sea sedimentary sequences. 3 units. *Corliss*

**209S. Climate Dynamics and the Paleoclimatic Record.** Introductory readings and reviews of modern physical climatology will be followed by extensive readings covering the record of past climatic change, concentrating on latest Quaternary and Holocene time. Topics include the global energy balance, the hydrologic cycle, general circulation of the atmosphere and oceans, climate modeling, future climate change, and the known record of paleoclimate (from marine and lake sediments, corals, soils, ice cores, etc.). Some background in physical sciences recommended. 3 units. *Baker*

**219S. Erosion.** Empirical and process-based approaches to description and prediction of sediment transport and erosion. Includes study of USLE, landscape evolution models, overland flow, gully formation, debris flows, landsliding, bedload and suspended load transport in rivers, and aeolian transport. Principles illustrated through case studies. Prerequisite: Geology 41 or consent of instructor. 3 units. *Haff*

**220S. Regional Geomorphology of the United States.** Origin, nature, and significance of natural features of the earth's surface, with focus on regional studies within the United States. Four main geographical areas emphasized each year from among Great Plains, Rocky Mountains, Colorado Plateau, Basin and Range, Columbia and Snake River Plains, Pacific Coast and Mountain System, Interior Mountains and Plateaus, Appalachian Mountains and Plateaus, Atlantic and Gulf Coastal Province. Prerequisites: open to graduates and advanced undergraduates with consent of instructor. 3 units. *Haff*

**221. Hydrogeology.** Theory of groundwater flow and solute transport with application to geologic processes, water resources, and water quality. Prerequisites: Chemistry 12L, Mathematics 103, and Physics 42L or consent of instructor. 3 units. *Rojstaczer*

**225S. Advanced Topics in Hydrogeology.** Hydrologic controls on the chemical and physical state of the earth's crust. Prerequisite: Geology 221 or consent of instructor. 3 units. *Rojstaczer*

**226. Advanced Environmental Geology.** A quantitative case history approach to the role of geological materials and processes in environmental assessment studies. The impact of rock type, faulting, folding, weathering, erosion, flooding, and underground fluid flow on the human environment. Field trips to environmentally sensitive sites and original research project required. Intended for students of the environment and engineering. 3 units. *Malin*

**230S. Advanced Structural Geology.** Stress and strain emphasizing geometric, kinematic, and dynamic analysis of micro structures and mesoscopic structures. Prerequisite: Geology 130 or consent of instructor. 3 units. *Karson*

**233S. Oceanic Crust and Ophiolites.** Structure, tectonics, petrology, and geochemistry of oceanic spreading environments and ophiolite complexes. Prerequisites: Geology 106L and 130 or consent of instructor. 3 units. *Karson*

**236S. Lithosphere Plate Boundaries.** Plate tectonics and the geological and geophysical expression of orogenic belts, spreading centers, transform faults, subduction zones. Prerequisite: Geology 130 or consent of instructor. 3 units. *Karson*

**237S. Structure and Evolution of the Appalachian Orogen.** Overview of sedimentation, deformation, and metamorphism responsible for the development of the Appalachian Mountain Belt from Newfoundland to Alabama in the context of plate tectonics. Prerequisites: Geology 106L, 110L, and 130 or consent of instructor. 3 units. *Karson*

**239S. Advanced Topics in Structural Geology and Tectonics.** Selected topics related to deformation of rocks ranging from microstructure to plate tectonics. Prerequisite: Geology 130 or consent of instructor. 3 units. *Karson*

**252. Introduction to Environmental Assessment Using Geophysical Measurements.** The geophysical methods used in assessing potential human impacts on environmentally sensitive sites. Included are the measurement and interpretation of gravity, magnetism, seismic waves, electrical properties, and fluid conditions. Practical examples and case histories, with special focus on the proposed North Carolina Low-Level Radioactive Waste Site. Same as Geology 152 except extra projects. Prerequisites: one year of physical sciences and calculus. 3 units. *Malin*

**253. Seismology I.** The generation, propagation, and observation of seismic waves in the earth. Basic continuum mechanics; the equations of seismology and their solutions; elementary source theory, seismic waves in the earth's structure and materials; seismic exploration of the lithosphere; seismic instrumentation. Offered on demand. 3 units. *Malin*

**254. Seismology II.** Continuation of Geology 253. Offered on demand. 3 units. *Malin*

**265S. Advanced Topics in Geochemistry.** Advanced readings in petrology and geochemistry. Consent of instructor required. 3 units. *Klein*

**269. Thermodynamics of Geological Systems.** Introductory thermodynamics applied to geologic problems through understanding of phase equilibrium. Prerequisites: Geology 105L (may be concurrent) and Mathematics 32. 3 units. *Boudreau*

**270. Sedimentary Geochemistry.** Chemistry of aqueous solutions and authigenic minerals in sedimentary systems. Prerequisites: Chemistry 12L and Mathematics 32. 3 units. *Baker*

**272. Biogeochemistry.** Processes controlling the circulation of carbon and biochemical elements in natural ecosystems and at the global level, with emphasis on soil and surficial processes. Prerequisite: Chemistry 12L or equivalent. C-L: Biology 272. 3 units. *Schlesinger*

**273S. Analytic Techniques.** An introduction to advanced analytic procedures used in the earth sciences: such as electron microbeam techniques (scanning electron microscopy, electron microprobe analysis) and plasma emission/absorption spectroscopy. Consent of instructor required. 1.5 units. *Boudreau and Klein*

**285S. Layered Intrusions.** Survey of layered igneous intrusions and current theories on crystallization and other processes in mafic magmas. Offered alternate years. Prerequisites: Geology 105L and 106L or consent of instructor. 3 units. *Boudreau*

**291. Independent Study.** Consent of instructor required. 3 units. *Staff*

**293S. Frontiers of Geology I.** Survey of the history, status, and trajectory of "hard-rock" petrology, structural geology, tectonics, and geophysics. 3 units. *Karson and staff*

294S. **Frontiers of Geology II.** Survey of the history, status, and trajectory of "soft-rock" petrology, stratigraphy, sedimentation, geochemistry, hydrology, and paleontology. 3 units. *Karson and staff*

295S. **Advanced Topics in Geology.** Topics, instructors, and credits to be arranged each semester. Variable credit. *Staff*

371, 372. **Advanced Topics in Geology.** To meet the individual needs of graduate students for independent study in various environmental sedimentary fields. Variable credit. *Staff*

#### **GEOLOGY COURSES CURRENTLY UNSCHEDULED**

201L. **Physical Processes in Coastal Environments**

202. **Beach and Island Geological Processes**

204. **Advanced Topics in Nearshore Processes**

206S. **Principles of Geological Oceanography**

214S. **Sedimentary Petrography**

215. **Clastics Facies Analysis: Recent and Ancient**

216. **Field Analysis of South Florida Carbonates**

217. **Field Analysis of Ancient Sedimentary Sequences**

222L. **Statistics and Data Analysis in Earth and Ocean Science**

223. **Numerical Methods in Hydrogeology**

249. **Marine Micropaleontology**

250. **Applied Mathematics for the Environmental and Earth Sciences**

258S. **Advanced Topics in Geophysics: Interdisciplinary Approaches to Problems in Tectonics, Seismology, and the Environment**

260S. **Applied Subsurface Stratigraphy**

271. **Isotope Geochemistry**

275. **Economic Geology**

283S. **Experimental Methods in Geology**

292. **Computer Methods in Geology**



## Courses Taught at the Marine Laboratory

### Biology

**10L. Marine Biology.** Physical and chemical characteristics of marine ecosystems and the functional adaptations of marine organisms to these systems. Lectures, field trips, and laboratories. For students not majoring in a natural science. (Given at Beaufort.) C-L: Marine Sciences. One course. *Kenney*

**114L. Biological Oceanography.** Physical, chemical, and biological processes of the oceans, emphasizing special adaptations for life in the sea and factors controlling distribution and abundance of organisms. One course (spring); one and one-half courses (summer). (Given at Beaufort and Bermuda.) Prerequisite: Biology 25L. C-L: Marine Sciences. Variable credit. *Ramus or staff (Beaufort); Nelson and Steinberg (Bermuda)*

**123. Analysis of Ocean Ecosystems.** The history, utility, and heuristic value of the ecosystem; ocean systems in the context of Odum's ecosystem concept; structure and function of the earth's major ecosystems. (Given at Beaufort.) Prerequisite: one year of biology, one year of chemistry, or consent of instructor. C-L: Marine Sciences. One course. *Barber*

**126. Marine Mammals.** Ecology, social organization, behavior, acoustic communication, and management issues. Focused on marine mammals in the southeastern United States (for example, bottlenose dolphin, right whale, West Indian manatee). (Given at Beaufort.) Prerequisite: introductory biology. C-L: Marine Sciences. One course. *Read or staff*

**126L. Marine Mammals.** Laboratory version of Biology 126. Laboratory exercises consider social organization and acoustic communication in the local bottlenose dolphin population. (Given at Beaufort.) Prerequisite: introductory biology. C-L: Marine Sciences. One course. *Read or staff*

**129L. Marine Ecology.** Factors that influence the distribution, abundance, and diversity of marine organisms. Course structure integrates lectures, field excursions, and independent research projects. Topics include characteristics of marine habitats, adaptation to environment, species interactions, biogeography, larval recruitment, rocky shores, marine mammals, fouling communities, tidal flats, beaches, subtidal communities, and coral reefs. Not open to students who have taken Biology 203L. (Given at Beaufort.) Prerequisite: none; suggested—introductory ecology, invertebrate zoology, or marine botany. C-L: Marine Sciences. One course. *Staff*

**130L. Tropical Marine Invertebrates.** (Given at Bermuda.) Prerequisite: introductory biology. See C-L: Environment 130L; also C-L: Marine Sciences. One course. *Coates*

**131L. Tropical Marine Ecology.** (Given at Bermuda.) Prerequisite: introductory biology. See C-L: Environment 131L; also C-L: Marine Sciences. One course. *Lipschultz, McKenna, and Smith*

**150L. Physiology of Marine Animals.** Environmental factors, biological rhythms, and behavioral adaptations in the comparative physiology of marine animals. One course (fall); one and one-half courses (summer). (Given at Beaufort.) Prerequisites: Biology 25L and Chemistry 12L. C-L: Marine Sciences. Variable credit. *Forward*

**155L. Biochemistry of Marine Animals.** Functional, structural, and evolutionary relationships of biochemical processes of importance to marine organisms. One course (fall and spring); one and one-half courses (summer). (Given at Beaufort.) Prerequisites: Biology 25L; and Chemistry 11L, 12L. C-L: Marine Sciences. Variable credit. *Rittschof*

**176L. Marine Invertebrate Zoology.** Structure, function, and development of invertebrates collected from estuarine and marine habitats. Not open to students who have taken Biology or Zoology 274L. One course (fall and Summer Term II); one and one-half courses (Summer Term I). (Given at Beaufort.) Prerequisite: Biology 25L. C-L: Marine Sciences. Variable credit. *Dimock (visiting summer faculty) or Kirby-Smith (environment)*

**191, 192. Independent Study.** Open to all qualified students with consent of supervising instructor and director of undergraduate studies. A maximum of three courses of 191, 192, 193T, and 194T may count toward the biology major. One course each. *Staff*

**193T, 194T. Tutorial.** For junior and senior majors with consent of director of undergraduate studies and supervising instructor. Three courses of 191, 192, 193T, and 194T, maximum. Variable credit. *Staff*

**295S, 296S. Seminar.** Variable credit. *Staff*

## **BIOLOGY COURSES CURRENTLY UNSCHEDULED**

### **113L. Behavioral Ecology**

#### **Botany**

**295S, 296S. Seminar.** Credit to be arranged. Variable credit. *Staff*

**359, 360. Research in Botany.** Individual investigation in the various fields of botany. Credit to be arranged. C-L: Marine Sciences. Variable credit. *All members of the graduate staff*

#### **Cell Biology**

**210. Independent Study.** Directed reading and study in cell biology/physiology. Descriptions of specific areas may be obtained from the director of graduate studies. Consent of director of graduate studies required. 3 to 9 units each. C-L: Marine Sciences. Variable credit. *Staff*

#### **Environment**

See the Environment General Courses section beginning on page 109 for descriptions of upper-level Environment courses taught at the Marine Laboratory.

**121. Climate Change: A Global Perspective.** Introduction to the scientific basis for prediction of global environmental change with emphasis on change in surface temperature, sea level, precipitation, and tropical cyclone activity. (Given at Bermuda.) C-L: Marine Sciences. One course. *Malmquist*

**122S. Climate-Related Hazards and Humanity.** The roles of science, politics, and business in quantifying and managing risks associated with climate-related hazards such as hurricanes. (Given at Bermuda.) C-L: Marine Sciences. Half course. *Malmquist*

**125. Remote Sensing and Long-term Environmental Monitoring.** Introduction to the theory and practice of environmental monitoring. Ocean biogeochemical cycles, tropical ecosystems, monitoring, and air and water pollution impact assessment and monitoring. (Given at Bermuda.) C-L: Marine Sciences. One course. *Nelson*

**130L. Tropical Marine Invertebrates.** Systematics, structure, and function of tropical marine invertebrates. Includes laboratory. (Given at Bermuda.) Prerequisite: introductory biology. C-L: Biology 130L and Marine Sciences. One course. *Coates*

**131L. Tropical Marine Ecology.** Factors influencing the distribution, abundance, and diversity of marine tropical organisms. Emphasis on coral reef and mangrove ecosystems. Includes laboratory. (Given at Bermuda.) Prerequisite: introductory biology. C-L: Biology 131L and Marine Sciences. One course. *Lipschultz, McKenna, and Smith*

**132S. Current Topics in Oceanography and Marine Biology.** Topics such as the Iron Hypothesis, toxic algal blooms, and UV light considered through readings in the primary literature and student presentations. (Given at Bermuda.) Prerequisite: introductory biology. C-L: Marine Sciences. Half course. *Lipschultz and Nelson*

**133S. Molecular Approaches to Questions of Physiology, Ecology, and Evolution in the Marine Environment.** (Given at Bermuda.) Prerequisite: introductory biology. C-L: Marine Sciences. Half course. *Trapido-Rosenthal*

**134L. Marine Biogeochemistry.** Biogeochemistry of carbon and nitrogen in the marine environment and associated laboratory techniques. Includes laboratory. (Given at Bermuda.) Prerequisites: introductory biology and introductory chemistry. C-L: Marine Sciences. One course. *Bates and Carlson*

**191, 192. Independent Study.** Open to qualified juniors and seniors with consent of instructor and director of undergraduate studies. Variable credit. *Staff*

## Geology

See the Geology Courses section beginning on page 121 for descriptions of upper-level Geology courses taught at the Marine Laboratory.

**191, 192. Independent Study.** Directed reading or research. Open only to qualified juniors and seniors by consent of director of undergraduate studies and supervising instructor. One course each or 3 units each. *Staff*

**195. Independent Study for Nonmajors.** Open to qualified juniors and seniors upon approval of the departmental faculty. One course or 3 units. *Staff*

## Zoology

**353, 354. Research.** To be carried on under the direction of the appropriate staff members. Hours and credit to be arranged. C-L: Marine Sciences. Variable credit. *Staff*

**360, 361. Tutorials.** An approved academic exercise, such as writing an essay or learning a research skill, carried out under the direction of the appropriate staff members. Hours and credit to be arranged. Variable credit. *Staff*













Durham, NC 27700

POSTMASTER send change of address

to: Office of Enrollment Services

Nicholas School of the Environment

Box 90330

Duke University

Durham, NC 27708-0330

10048  
MAY  
at Durham, NC

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*bulletin of*  
**Duke University**  
**1998-99**

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*Nicholas School of the Environment  
Marine Laboratory*





## The Mission of Duke University

The founding Indenture of Duke University directed the members of the university to "develop our resources, increase our wisdom, and promote human happiness."

To these ends, the mission of Duke University is to provide a superior liberal education to undergraduate students, attending not only to their intellectual growth but also to their development as adults committed to high ethical standards and full participation as leaders in their communities; to prepare future members of the learned professions for lives of skilled and ethical service by providing excellent graduate and professional education; to advance the frontiers of knowledge and contribute boldly to the international community of scholarship; to foster health and well-being through medical research and patient care; and to promote a sincere spirit of tolerance, a sense of the obligations and rewards of citizenship, and a commitment to learning, freedom, and truth.

By pursuing these objectives with vision and integrity, Duke University seeks to engage the mind, elevate the spirit, and stimulate the best effort of all who are associated with the university; to contribute in diverse ways to the local community, the state, the nation, and the world; and to attain and maintain a place of real leadership in all that we do.

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*bulletin of*  
**Duke University**  
**1997-98**

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*Nicholas School of the Environment  
Marine Laboratory*

Nicholas School of the Environment  
Marine Laboratory  
135 Duke Marine Lab Road  
Beaufort NC 28516-9721  
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Reservations, Facilities: 919-504-7504  
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The information in this publication applies to the calendar year 1998 and is accurate and current, to the extent possible, as of September 1997. The university reserves the right to change programs of study, academic requirements, teaching staff, the calendar, and other matters described herein without prior notice, in accordance with established procedures.

Duke University does not discriminate on the basis of race, color, national and ethnic origin, sexual orientation or preference, handicap, gender, or age in the administration of educational policies, admission policies, financial aid, employment, or any other university program or activity. It admits qualified students to all the rights, privileges, programs, and activities generally accorded or made available to students.

Duke University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404-679-4501) to award baccalaureates, masters, doctorates, and professional degrees.

#### DUKE UNIVERSITY UNDERGRADUATE HONOR CODE

An essential feature of Duke University is its commitment to integrity and ethical conduct. Duke's honor system helps to build trust among students and faculty and to maintain an academic community in which a code of values is shared. Instilling a sense of honor, and of high principles that extend to all facets of life, is an inherent aspect of a liberal education.

- As a student and citizen of the Duke University Community:
- I will not lie, cheat, or steal in my academic endeavors.
- I will forthrightly oppose each and every instance of academic dishonesty.
- I will communicate directly with any person or persons I believe to have been dishonest. Such communication may be oral or written. Written communication may be signed or anonymous.
- I will give prompt written notification to the appropriate faculty member and to the Dean of Trinity
- College or the Dean of the School of Engineering when I observe academic dishonesty in any course.
- I will let my conscience guide my decision about whether my written report will name the person or persons I believe to have committed a violation of this code.

I join the undergraduate student body of Duke University in a commitment to this Code of Honor.

Information that the university is required to make available under the Student Right to Know and Campus Security Acts may be obtained from the Office of University Relations at 68-2823 or in writing at 615 Chapel Drive, Duke University, Durham, NC 27708.

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# University Administration

## GENERAL ADMINISTRATION

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Joseph S. Ramus, *Director*  
Richard B. Forward, Jr., *Assistant Director*  
Richard T. Barber, *Director, DUNCOC*  
Celia Bonaventura, *Director, Marine/Freshwater Biomedical Center*  
Cynthia B. Adams, *Assistant Director of the Annual Fund and Alumni Affairs; Auxiliaries and Administrative Services Manager*  
Clifton W. Davis, *Physical Plant Manager*  
Dianne R. Gagnon, *Business Manager*  
William D. Hunnings, Jr., *Technical Services Manager*  
Quentin M. Lewis, Jr., *Marine Operations Manager*  
Howard L. Weckerle, *Projects Coordinator*

## Academic Administration

Joseph S. Ramus, Ph.D., *Professor of Biological Oceanography—Nicholas School of the Environment and Director—Marine Laboratory*  
Richard B. Forward, Ph.D., *Professor of Zoology, Assistant Director, and Director of Undergraduate Studies—Nicholas School of the Environment*  
Daniel Rittschof, Ph.D., *Associate Professor of Zoology and Director of Graduate Studies—Nicholas School of the Environment*  
Michael K. Orbach, Ph.D., *Professor in the Practice of Marine Affairs and Policy—Nicholas School of the Environment, and Director, Coastal Environmental Management Program*

## Advisory Board

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Charles F. Blanchard, *Raleigh, North Carolina*  
Mabel Bugg, *Raleigh, North Carolina*  
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Stephen E. Roady, *Washington, D.C.*  
Mary Price Taylor, *Beaufort, North Carolina*  
Norwood A. Thomas, Jr., *Durham, North Carolina*  
Elizabeth Thrower, *Key Largo, Florida*  
Wayne F. Wilbanks, *Norfolk, Virginia*

## Support Staff

Lisa Borden, *Computer Technician*  
Timothy W. Boynton, *Marine Technician, R/V Susan Hudson*  
William Campbell, *Assistant Head Cook*  
Gail W. Cannon, *Assistant to the Director of the Coastal Environmental Management Program*  
Alvinia L. Davis, *Food Service Aide*  
Claudia O. Davis, *Housekeeping Supervisor*  
Miyuki E. DeHart, *Library Associate*  
Guilia Ferruzzi, *Senior Research Technician*  
Margaret J. Forward, *Artist Illustrator*  
Donald Gagnon, *General Maintenance Mechanic Senior, Certified/Licensed*  
Eunice T. Godette, *Housekeeper*  
Gerald O. Godette, *Senior Research Technician*  
Michael W. Golden, *General Maintenance Mechanic Senior*  
Ellen D. Jones, *Staff Assistant*  
Lilian I. Lorenzsonn-Willis, *Staff Specialist*  
Donna M. Lynk, *Staff Specialist*  
Catherine McClellan, *Research Technician*  
W. Lanier Mitchum, *Captain, R/V Susan Hudson*  
James M. Murray, *Housekeeper*  
Sylvester Murray, *Assistant Head Cook*  
Helen E. Nearing, *Coordinator of Academic Programs*  
Olinda Nolen, *Housekeeper*  
Patricia M. Nolin, *Staff Specialist*  
Jeffrey E. Priddy, *Data Processing Specialist*  
Scott D. Taylor, *Assistant Director of Communications*  
Shirley E. Tesh, *Senior Research Technician*  
Sophia D. Turnage, *Staff Specialist*  
Bettie E. Tyson, *Food Service Aide*  
Belinda B. Williford, *Administrative Assistant, Marine Biomedical Center*  
Hugh C. Willis, *Chief Mate, R/V Susan Hudson*

## Duke/University of North Carolina Oceanographic Consortium Staff

Richard T. Barber, *Director of the Duke/University of North Carolina Oceanographic Consortium*  
Dwight B. Arrants, *Diving Safety Officer/Marine Technician, R/V Cape Hatteras*  
Karen D. Ashley, *Staff Specialist*  
Donny L. Baber, *Cook/Messman, R/V Cape Hatteras*  
Jonathan Borden, *Marine Technician, R/V Cape Hatteras*  
Robert A. Daniels, *A.B. Seaman, R/V Cape Hatteras*  
Mitchell A. Dixon, *First Assistant Engineer, R/V Cape Hatteras*  
Stephen E. Dixon, *A.B. Seaman, R/V Cape Hatteras*  
Quentin M. Lewis, Jr., *Marine Superintendent*  
Robert J. Lipscomb, *Steward/Cook, R/V Cape Hatteras*  
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Dale H. Murphy, *Chief Mate, R/V Cape Hatteras*  
John L. Nelson, *Bosun, R/V Cape Hatteras*  
Richard C. Ogus, *Master, R/V Cape Hatteras*  
Timothy G. Shaw, *Marine Technician*  
Mark E. Smith, *Chief Engineer, R/V Cape Hatteras*  
Joseph F. Ustach, *Executive Officer*





# Marine Laboratory Calendar\*

## Summer 1998

May 18—First summer term begins  
June 19—First summer term ends  
July 13—Second summer term begins  
August 14—Second summer term ends

## 1998

|           |  |
|-----------|--|
| August    |  |
| 31        | Fall term begins                                     |
| September |  |
| 11        | Drop/Add ends  |
| October   |  |
| 12-13     | Fall break   |
| 28        | Registration begins for spring semester, 1999        |
| November  |  |
| 17        | Registration ends for spring semester, 1999          |
| 18        | Drop/Add begins                                      |
| 25        | Thanksgiving recess (begins at 12:40 p.m. Wednesday) |
| 30        | Classes resume                                       |
| December  |  |
| 19        | Fall term ends                                       |

## 1999

|             |                                      |
|-------------|--------------------------------------|
| January     |                                      |
| 14          | Spring term begins                   |
| 27          | Drop/Add ends                        |
| March       |                                      |
| 15-19       | Spring break                         |
| 31-April 15 | Registration for fall semester, 1999 |
| April       |                                      |
| 16          | Drop/Add begins                      |
| May         |                                      |
| 8           | Spring term ends                     |
| 17          | First summer term begins             |
| June        |                                      |
| 18          | First summer term ends               |
| July        |                                      |
| 12          | Second summer term begins            |
| August      |                                      |
| 13          | Second summer term end               |

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\*The dates in the calendar are tentative and subject to change.



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## *General Information*



## The Nicholas School of the Environment

Duke University's Nicholas School of the Environment is unique among American universities, offering a distinctive combination of multidisciplinary graduate and professional degree programs, as well as opportunities for undergraduate study and continuing professional education. Inaugurated in 1991, the Nicholas School of the Environment builds on Duke's historically strong base in environmental science, economics and policy; the marine sciences; forestry, and geology. It combines the Duke University Marine Laboratory, Department of Geology, and the former School of Forestry and Environmental Studies, all of which have established reputations for excellence dating from 1938.

## The Marine Laboratory

Programs at the Marine Laboratory are central to the Nicholas School of the Environment's mission to provide interdisciplinary educational and research opportunities addressing an area of vital concern—the quality of the Earth's environment and the sustainable use of its natural resources. Oceans dominate the Earth's surface and greatly affect daily life. Oceans regulate climate, play a critical role in the hydrologic cycle, sustain a large portion of the Earth's plant and animal species, supply food and mineral resources, and inspire the aesthetic nature of humankind. Ocean studies are central to the resolution of global environmental problems related to the impacts of humans on ecological systems, biodiversity, climate change, coastal land management, environmental quality, and environmental health.

The Marine Laboratory is a campus of Duke University and a unit within the Nicholas School of the Environment. Its mission is education and research in basic ocean processes, coastal environmental management, marine biotechnology and marine biomedicine.

During the 1930s, Dr. A. S. Pearse and colleagues from Duke University were attracted to Pivers Island and its surrounding abundance of marine life for their summer field studies. The island afforded an excellent location for a field station and through the subsequent efforts of Dr. Pearse and others, the land was acquired for the Duke University Marine Laboratory. By 1938 the first buildings were erected. Originally, the laboratory served only as a summer training and research facility.

Today, the Marine Laboratory operates year-round to provide training and research opportunities to about 3,500 persons annually, including undergraduate, graduate and professional students enrolled in the university's academic programs; visiting student groups who use the laboratory's facilities; and scientists who come from North America and abroad to conduct research. A seminar/lecture series features many distinguished scientific speakers from across the nation and abroad.

The resident faculty represent the disciplines of oceanography, marine biology, marine biomedicine, marine biotechnology, and coastal environmental management.

The Marine Laboratory is a member of the National Association of Marine Laboratories (NAML), a nonprofit organization of over 90 members providing a variety of academic, research, and public service programs. The laboratories are unique "windows on the sea," providing information on the rich environmental mosaic of coastal habitats where land meets sea. Their 'sense of place' encourages wise local land management and protection of our precious natural resources.

## Location and Natural Environment

The Marine Laboratory is situated on Pivers Island within the Outer Banks of North Carolina, only 150 yards across the channel from the historic town of Beaufort. A bridge connects the island with US Highway 70, making the laboratory readily accessible by automobile. Other transportation to the area consists of bus service to Morehead City, about two miles distant from Beaufort, and airline service via regional airports (New Bern, Kinston, and Jacksonville).

Beaufort is the third oldest town in the state and is surrounded by fishing and agricultural communities. The area is well known for its historic and scenic attractions as well as being a seaside resort. Cape Lookout National Seashore Park and the Rachel Carson Estuarine Research Reserve are within easy boating distance.

The area's system of barrier islands, sounds, and estuaries is rich in flora and fauna, and diverse habitats, including rivers, creeks, mud flats, sand beaches, dunes, marshes, peat bogs, cypress swamps, bird islands, and coastal forests, making the area a haven for both nature lovers and those interested in the pursuit of marine science.

The laboratory is within range of both the temperate and tropical species of biota. The edge of the Gulf Stream oscillates between 30 and 40 miles offshore, with reefs on the wide continental shelf. A great variety of phytoplankton, seaweeds, seagrasses, and marshgrasses may be found in the area. Common animals include the blue crab, squid, shrimps, snails, clams, ctenophores, jellyfish, hydroids, sponges, polychaetes, sea urchins, starfish, brittle stars, sand dollars, skimmers, terns, gulls, herons, sea turtles, porpoises, and many species of fish. All provide ample opportunity for study and research and are readily accessible on foot, by car, or by boat.

The Beaufort-Morehead City area provides location for five other laboratories that collectively house one of the higher concentrations of marine scientists in the nation. These are the University of North Carolina's Institute of Marine Sciences, the North Carolina State University Seafood Laboratory, the North Carolina Aquarium at Bogue Banks, North Carolina Division of Marine Fisheries; and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service, Beaufort Laboratory. This concentration of marine scientists provides a critical mass for the pursuit of science and education.

## The Beaufort Experience

The Marine Laboratory is an academic community, and the self-sufficient nature of its residential life serves well those who wish to study or to conduct research. The academic programs are limited to eighty students per regular academic semester (spring or fall) and one hundred per summer term, offering an unparalleled small-group learning experience. Although recreational opportunities are ample, the distractions are limited, allowing both student and researcher to become totally involved in the pursuit of marine science. Both students and researchers alike find that the Marine Laboratory has an invitingly open, friendly, and relaxed atmosphere that draws many back year after year. This community feeling, the potential for total immersion in learning, and the beauty of the natural environment have contributed to what has been called "The Beaufort Experience."



## Teaching and Research Facilities

The Marine Laboratory's modern physical plant consists of 23 buildings, including four dormitories, a large dining hall, one residence, a boathouse that has been remodeled as a student commons, a storehouse for ship's gear, classroom laboratories, six research buildings, and a maintenance complex. The Marine Laboratory operates the R/V *Susan Hudson*, a 57-foot fully-equipped coastal oceans research vessel, and is the home port for the R/V *Cape Hatteras*, a 135-foot oceanographic research vessel operated by the Duke/University of North Carolina Oceanographic Consortium.

The laboratory also maintains an electronics shop, a workshop, a stockroom, and a purchasing department.

**Research Laboratories.** Each research laboratory building is air-conditioned and equipped with running seawater through a PVC system. There are tanks, water tables, aquaria, autoclaves, ovens, and outdoor continuous-flow growth facilities. In addition to commonly used laboratory equipment, the following are available: refrigerated centrifuges, fluorometers, spectrophotometers, balances, pH meters, hoods, liquid scintillation counter, constant temperature equipment, and HPLC.

**Computing Facilities.** The Nicholas School of the Environment Marine Laboratory houses two Sun Sparc stations as well as two Duke University public access clusters, MAC and IBM-PC, all connected to the Internet. Available for use are eleven 586-based workstations and five Power PCS with word processing and statistics programs.

The laboratory operates an AT-compatible computer for processing and analysis of static and moving images. Static images captured with a video camera and Targa-M8 frame grabber board can be analyzed by means of the JAVA software dander Scientific). Graphic and printed output of results is possible using an HP 7475A plotter or an HP LaserJet printer. Moving images are recorded on video tape and analyzed using the Motion Analysis System (Celltrack Motion Analysis Expertvision System, Motion Analysis Corp.). A video processor in an IBM/AT-compatible computer tracks objects and calculates direction of movement, velocity, and rate of change of direction. Statistical and graphics programs allow final processing of these data.

Color printing and scanning services are also available on the island.

**I. E. Gray Library-Auditorium.** Located in the building are the 1,917-square-foot auditorium with stage, a library, the librarian's office, and one seminar room. The auditorium has a seating capacity of approximately 200 and is suitable for lectures, seminars, symposia, and small regional or national meetings. Inquiries concerning use of auditorium or seminar room space should be addressed to Cindy Adams (919) 504-7504 or e-mail cba@mail.duke.edu.

**Library Facilities.** The Pearse Memorial Library is a branch library of the Duke library system. It holds approximately 23,000 volumes with a concentration in the marine sciences. The library currently subscribes to 60 scientific journals and a few CD ROMs. Support services include a general access copier, interlibrary loan within the Duke-UNC-NCSU library systems, and on-line literature search capabilities.

Cooperative agreements for interlibrary loan and document delivery service have also been established with the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA/NMFS) and University of North Carolina Institute of Marine Sciences (UNC/IMS), and University of North Carolina at Wilmington.

**Natural History Resource Center.** The Natural History Resource Center (NHRC) preserves and disseminates knowledge concerning ecological systems and the distribution and abundance of marine plants and animals. The center consists of an extensive reference collection of marine organisms (the museum), a library of taxonomic



references and ecological publications, a large outdoor seawater facility, and a research laboratory designed to facilitate the collection, preservation and identification of marine organisms. The center provides students, researchers and lay persons with advice on the natural history of North Carolina's marine ecosystems. Dr. William Kirby-Smith is the director.

**Research Vessels.** The R/V *Susan Hudson* is USCG certified to carry passengers for hire to 100 miles. This 57-foot, welded aluminum vessel is powered by twin diesels to a speed of 16 knots. It is fully equipped for light duty oceanographic research, including an SHE 25 CTD with PAR meter, fluorometer and transmissometer. Funding from the National Science Foundation and the Office of Naval Research has provided for many research instruments that are available to visiting investigators. A marine technician is available to facilitate cruises. Inquiries concerning use of the research vessel should be directed to Karen D. Ashley (919) 504-7583 or e-mail to [karena@duncoc.ml.duke.edu](mailto:karena@duncoc.ml.duke.edu).

Marine Laboratory students and researchers also have access to the R/V *Cape Hatteras*, operated by the Duke/University of North Carolina Oceanographic Consortium.

## MARINE/FRESHWATER BIOMEDICAL CENTER

The Marine/Freshwater Biomedical Sciences Center of Duke University is a problem-oriented center that is nationally and internationally recognized for its contributions to environmental health. It integrates unique facilities and faculty expertise available on the Beaufort and Durham campuses of Duke University and applies this powerful collective strength to challenging problems of human and environmental health significance, with a focus on the adverse effects associated with the toxicity of metals and free radicals. Research advances by center investigators increase the understanding of underlying toxic mechanisms, so that good human and environmental health choices can be made.

The center is distinguished by its record in biotechnology, its interdisciplinary programs, and its effectiveness in advancing marine and freshwater model systems for mechanistic studies. It is unique in its intellectual setting, providing a bridge between Duke's nationally recognized School of Medicine, Nicholas School of the Environment and Marine Laboratory. In its physical setting it draws effectively on the institutes and industries of the Research Triangle of North Carolina. Through its interactive workshops and outreach efforts, the center communicates research findings on marine and freshwater aspects of environmental health problems to the clinical and research arms of the medical community, policy makers and the public at large.

The specific aims of the center are to:

- Enhance the unique strengths of environmental health research programs of center investigators, drawing expertise from the university and from the region
- Provide a cohesive framework for interdisciplinary interactions, information exchange, and innovative technology development focused on metal and free radical toxicity
- Aid in the development and use of marine and freshwater model systems for mechanistic studies of human and environmental health relevance
- Enhance the application of existing hightech facilities and methodologies to both individual and collective environmental health research programs
- Provide community outreach and education that informs scientists, policy makers and the public at large about environmental health issues and research advances

Feasibility studies are conducted to explore the advantages of various experimental approaches and to encourage innovative research.

Students interested in working with members of the center's participating faculty should direct their first inquiry to the Admissions Office, Nicholas School of the Environment Marine Laboratory, 135 Duke Marine Lab Road, Beaufort, North Carolina 28516-9721; telephone (919) 504-7502. It should be noted, however, that the center does not grant degrees. Graduate students are enrolled in the degree program of the respective department or school of their mentor.

Researchers may direct their inquiries to the office of the Marine/Freshwater Biomedical Center, telephone (919) 504-7508. Dr. Celia Bonaventura serves as center director.

## **DUKE/UNIVERSITY OF NORTH CAROLINA OCEANOGRAPHIC CONSORTIUM**

The Duke/University of North Carolina Oceanographic Consortium operates a 135-foot oceanographic research vessel, the R/V *Cape Hatteras*. The ship operates both on the continental shelf and in the deep sea in the western North Atlantic, concentrating in the region between Nova Scotia and the Caribbean. The ship is a member of the academic research fleet supported by the National Science Foundation for the purpose of providing oceanographic research opportunities to investigators.

R/V *Cape Hatteras* is used for training at sea by the universities that make up the Oceanographic Consortium (Duke, North Carolina State, UNC-Chapel Hill, UNC-Wilmington, UNC-Greensboro, and East Carolina). The consortium also manages the acquisition and maintenance of oceanographic instrumentation used aboard R/V *Cape Hatteras*, and holds annual meetings of ocean science staff from member institutions at the Duke University Marine Laboratory. Inquiries concerning use of the research vessel should be directed to Quentin M. Lewis, Jr. (919) 504-7580 or e-mail to [quentinl@duncoc.ml.duke.edu](mailto:quentinl@duncoc.ml.duke.edu).

## **MARINE SCIENCES EDUCATION CONSORTIUM**

The Marine Sciences Education Consortium (MSEC) was developed to provide a formal curriculum in the marine sciences, including supervised research, to member institutions. Such institutions are liberal arts colleges or universities attended by students who are preparing for careers in the marine sciences or who have a strong liberal arts interest in the oceans but for whom no specialized programs in the marine sciences are available. MSEC students have access to the spring and fall semester programs in marine sciences as well as the summer program at the Duke Marine Laboratory. The room and board plan is available to MSEC students.

Currently, member institutions include Albright College, Allegheny College, Denison University, the Five Colleges Coastal and Marine Sciences Program (Amherst College, Hampshire College, Mount Holyoke College, Smith College, and the University of Massachusetts), Furman University, Gettysburg College, Hampden-Sydney College, Hood College, Juniata College, Lees-McRae College, Macalester College, Miami University, North Carolina State University, University of Notre Dame, Oberlin College, Presbyterian College, University of Richmond, Trinity College, Washington and Lee University, Wittenberg University, and the College of Wooster.

Members join upon invitation and mutual agreement. Inquiries from interested institutions are welcome and requests to join the MSEC will be considered. Such inquiries should be addressed to the Director, Nicholas School of the Environment Marine Laboratory, 135 Duke Marine Lab Road, Beaufort, North Carolina 28516-9721.

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*The Faculty*



## The Faculty and Their Programs

**Richard T. Barber**, Ph.D., *Harvey W. Smith Professor of Biological Oceanography, Nicholas School of the Environment*; B.S., Zoology and Botany, Utah State University; Ph.D., Biological Science, Stanford University.

Dr. Barber's research in carbon cycling by ocean processes has implications for climate regulation. At Duke he investigates the interrelationship of large-scale thermal dynamics and ocean basin productivity, emphasizing (1) how biological and physical processes contribute to the exchange of carbon dioxide between the ocean and the atmosphere and (2) how the "biological pump" transfers carbon into the deep sea. With current field work being carried out on cruises in the Southern Ocean, his research group is focusing on the role of physical conditions in regulating primary production and phytoplankton performance. He is also investigating the role of a single micronutrient, iron, in the regulation of primary production in Antarctic waters as well as the equatorial Pacific, where a high nutrient/low chlorophyll character persists despite physical and chemical conditions which otherwise favor high productivity.

Barber, R.T., J.W. Murray, Jr., and J.J. McCarthy. 1994. Biogeochemical interactions in the equatorial Pacific. *Ambio* 23:62-66.

Barber, R., R. Ohrel, P. Fowler, and G. Gilbert. 1994. Why we are convinced that traditional strategies for wastewater management are not working. In *Integrated Coastal Wastewater Management in North Carolina*, R. Ohrel (ed.), pp. 7-13. Swansboro: North Carolina Coastal Federation.

Barber, R.T., M.P. Sanderson, S.T. Lindley, F. Chat J. Newton, C.C. Trees, D.G. Foley, and F.P. Chavez. 1996. Primary productivity and its regulation in the equatorial Pacific during and following the 1991-92 El Nino. *Deep-Sea Research II* 43:933-969.



**Celia Bonaventura**, Ph.D., *Professor of Cell Biology, Nicholas School of the Environment; B.A., Zoology, San Diego State University; Ph.D., Biochemistry, University of Texas, Austin.*

Dr. Celia Bonaventura's research concerns molecular aspects of environmental toxicity associated with metals and free radical interactions. She has written several articles on environmental bioremediation and a new line of study in her laboratory concerns the molecular adaptations in marine microbes that accompany pollutant exposure. She has a long-standing interest in respiratory proteins (hemoglobins and hemocyanins) and their adaptations to differing environments. Studies by her and collaborators have increased our understanding of adaptive mechanisms that allow respiratory proteins to satisfy widely different physiological and environmental demands. She has also documented some of the structural alterations of respiratory proteins that are indicative of exposure to xenobiotics. Her research makes use of biochemical and molecular biological procedures, such as isolation of gene products and measurements of rapid reaction kinetics and equilibria, using UV/VIS and fluorescence spectroscopy and spectroelectrochemistry.

Swerdlow, R.D., K.I. Miller, P. Lee, C. Bonaventura, and R.F. Ebert. 1996. Keyhole limpet hemocyanin: Structural and functional characterization of two different subunits and multimers. *Comp. Biochem. Physiol.* 113B:537-548.

Jia, L., C. Bonaventura, J. Bonaventura, and J.S. Stamler. 1996. S-Nitrosohemoglobin: A dynamic activity of blood involved in vascular control. *Nature* 380:221-226.

Bonaventura, C. and F. Johnson. 1997. Health environments for healthy people: Bioremediation today and tomorrow. *Environ. Health Sci. Persp.* 105: 5-20.

**Joseph Bonaventura**, Ph.D., *Professor of Cell Biology, Nicholas School of the Environment B.A., Zoology, San Diego State University; Ph.D., Biochemistry, University of Texas, Austin.*

Dr. Joseph Bonaventura's research involves marine organisms found in diverse environments. Biochemical studies on the structural and functional diversity of these organisms has been shown to be paralleled by diversity at the molecular level. Red cells and respiratory proteins of marine organisms are being studied in order to increase the understanding of molecular adaptations and the mechanisms that give rise to functional flexibility. The kinetics and equilibria of ligand binding to hemoglobins, hemocyanins, and cytochrome c oxidase are studied with emphasis on the reactivity of these proteins as regulated by metabolic effectors. These studies are complemented by work in the biomedical sciences. Some of his work is carried out in the Protein Engineering and Technology Laboratory where properties of chemically modified, crosslinked, and immobilized forms of biologically active molecules are characterized. Recent research concerns the development of a synthetic blood substitute for humans. The project involves a detailed study of structure-function relationships in the human hemoglobin molecule and includes site-directed mutagenesis of hemoglobin genes. A new focus concerns the biochemistry of nitric acid in the human body and the development of a hypothesis of how this simple molecule might act as a regulator of the biosphere.

Robertson, J.D., J. Bonaventura, and A. Kohm. 1995. Nitric oxide synthase inhibition blocks octopus touch learning without producing sensory or motor dysfunction. *Proc. R. Soc. Lond. B* 261:167-172.

Weinberg, J.B., E. Doty, J. Bonaventura, and A.F. Haney. 1995. Nitric oxide inhibition of human sperm motility. *Fertility and Sterility* 64(2): 408-413.

Jia, L., C. Bonaventura, J. Bonaventura, and J. S. Stamler. 1996. S-Nitrosohaemoglobin: A dynamic activity of blood involved in vascular control. *Nature* 380:221-226.

**Larry B. Crowder, Ph.D.,** *Professor of Marine Ecology, Nicholas School of the Environment; B.A., Biology and Mathematics, California State University-Fresno; M.S., Ph.D., Zoology, Michigan State University.*

Dr. Crowder's research centers on predation and food web interactions, mechanisms controlling recruitment variation in fishes, and on population modeling in conservation biology. He has studied food web processes in estuaries and lakes, and has used observational, experimental and modeling approaches to understand these interactions in an effort to improve fisheries management. He is a member of the Program Management Committee for SABRE (South Atlantic Bight Recruitment Experiment), a NOAA-funded project that focuses on identifying the unique characteristics of survivors of a cohort of fishes and links those characteristics to physical or biological variability. He has also been involved in population modeling and data analysis to address various management scenarios for threatened and endangered species. He and his students have developed life-history population models to address various management problems including exotic species introductions, acidification, habitat modification, bycatch and harvest for both freshwater and marine fishes.

Crowder, L.B., S.R. Hopkins-Murphy, and A. Royle. 1995. Estimated effect of Turtle-Excluder Devices (TEDs) on loggerhead sea turtle strandings with implications for conservation. *Copeia* 1995:773-779.

Crowder, L.B., D. Reagan, and D.W. Freckman. 1996. Food-web dynamics and applied problems. In *Food Webs: Integration of Patterns and Dynamics*, G.A. Polis and K.O. W'nemiller (eds.), pp.327-336. New York: Chapman & Hall.

Marschall, E.A. and L.B. Crowder. 1996. Assessing population responses to multiple anthropogenic effects: A case study with brook trout. *Ecol. Appl.* 6:152-167.

**Richard B. Forward, Ph.D.,** *Professor of Zoology, Nicholas School of the Environment; B.S., Biology, Stanford University; Ph.D., Biology, University of California, Santa Barbara.*

Dr. Forward and his students investigate the behavior and physiology of estuarine and coastal zooplankton. This includes the photobehavior, photophysiology, biological rhythms, diurnal vertical migration, and horizontal migration of crustacean and fish larvae. Laboratory studies determine the effects of temperature, salinity, and feeding on phototaxis and geotaxis, salinity perception, and polarized light perception. Field studies have looked at horizontal and vertical distributions as related to environmental factors. Additional studies considered the cues for metamorphosis of crustaceans.

Forward, R.B., Jr., J.S. Burke, D. Rittschof, and J.M. Welch. 1996. Photoresponses of larval Atlantic menhaden (*Brevoortia tyrannus*) in offshore and estuarine waters: Implications for transport. *J. Exp. Mar. Biol. Ecol.* 199: 123-135.

Forward, R.B. Jr., M.C. De Vries, D. Rittschof, D.A.Z. Frankel, J.P. Bischoff, C.M. Fisher, and J.M. Welch. 1996. Effects of environmental cues on metamorphosis of the blue crab *Callinectes sapidus*. *Mar. Ecol. Prog. Ser.* 131:165-177.

Forward, R.B., Jr., J. Swanson, R.A. Tankersley, and J.M. Welch. 1997. Endogenous swimming rhythms of blue crab megalopae: Effects of offshore and estuarine cues. *Mar. Biol.* 127:621-628.

**William W. Kirby-Smith, Ph.D.,** *Associate Professor in the Practice of Marine Ecology, Nicholas School of the Environment; B.S., Biology, University of the South; Ph.D., Zoology, Duke University.*

Dr. Kirby-Smith's research interests involve marine ecology and invertebrate zoology. His recent research projects include the following: (1) ecology of rock outcrop communities on the continental shelf; (2) effects of salt marsh modifications on plant, invertebrate, fish and bird communities; (3) influence of pine plantation drainage on water quality and benthic invertebrates in receiving estuarine headwaters; (4) effects of

agricultural development upon hydrology, water quality and biology in estuarine headwaters; and (5) the fate of fecal coliform bacteria in storm water runoff and estuarine headwaters. Additional research interests include the physiology of suspension feeding and its ecological consequences in estuaries.

Ustach, J. F., W. W. Kirby-Smith, and R.T. Barber.1986. Effects of watershed modification on a small coastal plain estuary. In *Estuarine Variability*, D. Wolfe (ed.), pp.177-192. New York: Academic Press.

Kirby-Smith, W. W., R. B. Forward, Jr., and S. Thompson.1989. Use of grass shrimp (*Palaemonetes pugio*) larvae in field bioassays of the effects of agricultural runoff into estuaries. In *Pesticides in Terrestrial and Aquatic Environments*, D. L. Weigmann (ed.), pp. 29-36. Proc. Nat. Res. Conf., May 11-12, 1989. Blacksburg: Virginia Water Resources Research Center.

Kirby-Smith, W., S. J. Eisenreich, J. T. Howe, and R. A. Luettich, Jr.1993. The effects in estuaries of pesticide runoff from adjacent farmlands. Report. U.S. Environmental Protection Agency. CR813415:205pp.

David R. McClay, Jr., Ph.D., *Professor of Zoology, Neurobiology, and Immunology; B.S., Zoology, Pennsylvania State University; M.S., Zoology, University of Vermont; Ph.D., Zoology, University of North Carolina, Chapel Hill. [Resident on the Durham campus.]*

Three areas of major focus of our work have been: 1) on contributions of cell adhesion during two important morphogenetic cell rearrangements in embryos. At gastrulation we have observed a series of molecular changes in adherens junctions and focal contacts. Mesoderm cells at ingression lose both these adhesive structures and invade the blastocoel. Later, endoderm cells rearrange to form the archenteron, and in the process both adherens junctions and focal contacts are altered. We have cloned cadherins, catenins, and integrins to study these rapid morphogenetic changes that involve an epithelial-mesenchymal cell conversion and convergent-extension cell rearrangements. Our studies focus on the sequence of events involved in that switch from an epithelial cell to a mesenchymal cell, and in the sequence through which the primitive gut is formed. 2) to study a number of cell signaling events that have been associated with cell rearrangements and pattern formation in the sea urchin embryo. The cell-signaling contributions of hedgehog,  $\beta$ -catenin, and Notch are being studied as they participate in the correct spatial organization and transmit inductive signals that control specific morphogenetic properties. 3) to study the biophysics of cell adhesion using mammalian cells in culture. Our focus is on the mechanism by which initial cell contacts become rapidly strengthened through interactions with the cytoskeleton. Of particular interest is the mechanism by which imposed tension regulates that adhesive strength.

Miller, J. and D.R. McClay. 1997. A cadherin in sea urchin development: dynamics of a cell adhesion molecule during early morphogenetic movements. *Dev. Biol.* (In press.)

Logan, C. and D.R. McClay. 1997. The allocation of early blastomeres to the ectoderm and endoderm is variable in the sea urchin embryo. *Development* (In press.)

Miller, J.R. and D.R. McClay. 1997. Changes in the pattern of adherens junction-associated  $\beta$ -catenin accompany morphogenesis in the sea urchin embryo. *Dev. Biol.* (In press.)

Patricia D. McClellan-Green, Ph.D., *Assistant Research Professor, Nicholas School of the Environment; B.S., M.S., Biology, East Carolina University; Ph.D., Toxicology, North Carolina State University.*

Dr. McClellan-Green's research focuses on the study of natural and man-made toxins in the marine environment and their effects on the metabolic activities of marine organisms. Her current research projects include (1) determining the mechanisms of



PAH and PCB mediated gene regulation in fish, (2) the effects of marine dinoflagellate toxins on cellular metabolism, and (3) the isolation and characterization of various cytochrome P450s from marine organisms.

McClellan-Green, P.D., E. Noga, D. Baden, L.A. Jaykus, and D.P. Green. 1997. Cytotoxicity of a putative toxin from the *Pfiesteria piscicida* dinoflagellate. *Fund. and Appl. Toxicol. (Suppl)* 36(1):276.

Oberdoerster, E., D. Rittschof, and P. McClellan-Green. Testosterone metabolism in imposex and normal *I. obsoleta*: Studies with natural and induced imposex snails. *Mar. Pollut. Bull.* (Submitted)

Oberdoerster, E., D. Rittschof, and P. McClellan-Green. Induction of cytochrome P450 3A by tributyltin in blue crab, *Callinectes sapidus*. *Aquatic Toxicol.* (Submitted)

**Michael K. Orbach**, Ph.D., *Professor in the Practice of Marine Affairs and Policy, Nicholas School of the Environment, B.A., Economics, University of California, Irvine; M.A., Ph.D., Cultural Anthropology, University of California, San Diego.*

Dr. Orbach's research interests are in the application of social and policy sciences to coastal and ocean policy and management. His work uses a cultural, or human, ecology perspective to analyze human behavior in coastal and ocean environments. His current research projects include (1) the development and application of limited entry and effort management systems to marine fisheries; (2) the formation and socioeconomic impact of marine minerals policy; (3) marine mammal and endangered species-fisheries conflicts; and (4) citizen involvement in coastal and ocean policy. Dr. Orbach specializes in the application of social science to the policy and management process.

Cicin-Sain, B., M. Orbach, et al. 1986. Conflictual interdependence: U.S.-Mexico relations on fishery resources. *Natural Res. J.* 26(4):769-792.

Orbach, M., and B. Queen. 1990. Ocean policy initiatives in coastal states: North Carolina's experience. *Coastal Management* 18:267-281.

Johnson, J., and M. Orbach. 1991. The impact of urbanization on Florida's spiny lobster fishery. *City and Society* 2(1):95-112.

**C. Barry Osmond**, Ph.D., *Adjunct Research Professor, Nicholas School of the Environment; B.S., M.S., Botany, University of New England, Australia; Ph.D., Botany, University of Adelaide, Australia.*

Collaborations continue between Dr. J. Ramus, Duke University Marine Laboratory and Dr. Osmond in studies of photoinhibition of photosynthesis in marine macrophytes. These plants display interactions between rapidly reversible processes of photon protection (disposal of excess light as heat in the antennae of photosystems) and slowly reversible processes of photodamage (damage to and repair of the reaction center of photosystem II) which are more readily studied in-vivo than in land plants. The common marine macrophyte *Ulva rotundata* has become a model plant for these studies.

Osmond, C. B. 1994. What is photoinhibition? Some insights from comparisons of shade and sun plants. In *Photoinhibition*, N. R. Baker and J. R. Bowyer (eds.), pp. 1-24. Bios. Scientific Publ.

Shapira, M., A. Lers, P. B. Heifetz, C. B. Osmond, N. W. Gillham, and J. E. Boynton. 1997. Differential regulation of chloroplast gene expression in *Clamydomonas reinhardtii* during photoacclimation. Light stress transiently suppresses synthesis of Rubisco LSU protein while enhancing synthesis of the PSII D1 protein. *Plant Mol. Biol.* 33:1001-1011.

**Joseph S. Ramus**, Ph.D., *Professor of Biological Oceanography, Nicholas School of the Environment; A.B., Ph.D., Botany, University of California, Berkeley.*

Dr. Ramus's research includes the study of physical forcing of primary productivity in coastal plains estuaries. The research seeks a match between physiological response and the temporal frequency of physical drivers, the phasing of the organism with its



environment.

Another of Dr. Ramus's interests involves biotechnological research which includes extracellular polysaccharides produced by marine microphotoautotrophs. Two aspects are under investigation: (1) environmental regulation of carbon partitioning; i.e., the diversion of newly fixed carbon from growth (new photosynthetic machinery) to disposable heteropolysaccharides (viscoelastic biopolymers), and (2) drag reducing properties of the biopolymers in pipe flow.

A third area under investigation is photoacclimation and photoinhibition in seaweeds and seagrasses. Of specific interest are macromolecular changes in the photosynthetic apparatus, the dynamic range of change and the effect of change on growth rate.

Ramus, J. 1992. Productivity of seaweeds. In *Primary Productivity and Biochemical Cycles in the Sea*, P. Falkowski and A. D. Woodhead (eds.), pp.239-255. New York: Plenum Press.

Litaker, W., C. S. Duke, B. E. Kenney, and J. Ramus. 1993. Short-term environmental variability and phytoplankton abundance in a shallow tidal estuary. II. Spring and fall. *Mar. Ecol. Prog. Ser.* 94:141-154.

Osmond, B., J. Ramus, G. Levavasseur, L.A. Franklin, and W.S. Henley. 1993. Fluorescence quenching during photosynthesis and photoinhibition of *Ulva rotundata*. *Planta* 190:97-106.

**Andrew J. Read, Ph.D., Mary Derrickson McCurdy Fellow and Assistant Professor in the Practice of Marine Mammalogy, Nicholas School of the Environment; B.S., M.S., Ph.D., Zoology, University of Guelph.**

Dr. Read's research focuses on the life history and conservation biology of dolphins, porpoises and other marine mammals. This work consists of longitudinal studies of coastal populations and examination of samples from strandings or incidental catches in commercial fisheries. Particular attention is paid to how animals partition energy among the competing demands of growth, maintenance and reproduction.

Dr. Read's research group also examines the impacts of human activities on populations of marine mammals and attempts to find solutions to such conflicts. In particular, this work examines the effects of removals from populations caused by incidental mortality in commercial fisheries. This work is multifaceted and involves examination of animal behavior around nets, modification of fishing gear to minimize mortality, and demographic analyses of the effects of incidental catches.

Hohn, A.A., A.J. Read, S. Fernandez, O. Vidal, and L. Findley. 1996. Life history of the vaquita *Phocoena sinus* (Phocoenidae, Cetacea). *J. Zool., London* 239:235-251.

Kraus, S.D., A.J. Read, E. Anderson, K. Baldwin, A. Solow, T. Spradlin, and J. Williamson. 1997. Acoustic alarms reduce the incidental mortality of porpoises in gill nets. *Nature*: In press.

Read, A.J. and K.A. Tolley. 1997. Postnatal growth and allometry of harbour porpoises from the Bay of Fundy. *Can. J. Zool.* 75:122-130.

**Daniel Rittschof, Ph.D., Associate Professor of Zoology, Nicholas School of the Environment B.S., Ph.D., Zoology, University of Michigan.**

Dr. Rittschof's research interests involve chemical communication systems. His studies include external and internal molecular mediation of behavior (chemical ecology). At present, test systems are marine and include crustaceans (true crabs, hermit crabs and barnacles), molluscs and fish. Studies span the gamut from practical (nontoxic antifouling coatings, fish foods and fish feeding stimulants) to purely basic (larval release pheromones, designer peptides with biological activity, hermit crab shell attractant cues, hormonal control of feeding behavior, and enzymatic activities in crustacean and gastropod saliva). The driving theme of the work is the evolution of

chemical communication systems and their components.

Rittschof, D., R.B. Forward, Jr., G. Cannon, J.M. Welch, M.M. McClary, Jr., E.R. Holm, A.S. Clare, S. Conova, L.M. McKelvey, P. Bryan, and C.L. Van Dover. 1997. Cues and context: larval responses to physical and chemical cues. *Biofouling*

Rittschof, D. and B.A. Hazlett. 1997. Behavioral responses of hermit crabs *Clibanarius vittatus* (Bosc) to shell cues, other stimuli and predator odor. *J. Mar. Biol. Assoc. U.K.*

Rittschof, D. and E.R. Holm. 1997. Antifouling and foul-release: A primer. In *Recent Advances in Marine Biotechnology*, Vol. I, M. Fingerman and R. Nagabushanam (eds). New Delhi: Oxford & IBH Publishing.

## Other Instructional Staff

**Bruce E. Kenney**, Ph.D., *Instructor, Nicholas School of the Environment*; B.S., Biology, Bates College; M.S., Botany, University of Wisconsin; Ph.D., Botany, Duke University.

Physiological ecology of photosynthesis by marine algae, specifically the influence of environmental conditions on photosynthetic production, is Dr. Kenney's primary area of interest. Understanding time scales of environmental variability is essential in determining the influence of such variations on photosynthetic performance. The practical aspects of fish nutrition and diet based on physiological principles is an important secondary interest.

Kenney, B. E., W. Litaker, C. S. Duke, and J. Ramus. 1988. Community oxygen metabolism in a shallow tidal estuary. *Estuarine Coastal Shelf Sci.* 27:33-43.

Ramus, J., B. E. Kenney, and E. J. Shaughnessy. 1989. Drag reducing properties of microalgal exopolymers. *Biotechnol. Bioeng.* 33:550-557.

Litaker, W., C. S. Duke, B. E. Kenney, and J. Ramus. 1993. Short-term environmental variability and phytoplankton abundance in a shallow tidal estuary. II. Spring and fall. *Mar. Ecol. Prog. Ser.* 94:141-154.

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## *Program of Study*



## General Information

In today's competitive world, students seek education not only for self-enrichment, but also for career enhancement. Ocean studies can fulfill both needs. The orderly exploitation of the earth's remaining frontier, the oceans, requires not only marine scientists, but increasingly requires managerial, legal, business, and political leaders who understand the oceans. Exploration and research must now be complemented by development, regulation and conservation.

The programs of study offered at Duke Marine Laboratory serve undergraduate majors in the natural sciences or environmental sciences and policy, as well as other undergraduate majors who have an interest in these areas of study and who have adequate preparation. The semester programs (fall and spring) are designed for college juniors and seniors; the summer term courses are open to qualified undergraduates. Students from any college or university may apply. For participation in a semester program, it is advised that students have completed introductory college courses in biology, chemistry, and mathematics before attending. The general prerequisites for most of the summer courses are introductory college biology and/or chemistry. Other prerequisites may be specified in the individual course descriptions.

Graduate students may also participate in the fall or spring semesters and summer terms. The 200-level courses are intended for graduate and advanced undergraduate students.

The programs provide students with an opportunity to live and study at the Duke Marine Laboratory year-round. The programs emphasize small class size, independent research, and integrated classroom, laboratory, and field experience. Students have daily access to a specialized faculty, modern scientific equipment, and the surrounding natural marine environment.

Over the last five decades, approximately 5,000 students from over 300 institutions of higher learning have taken course work at the Duke Marine Laboratory. Thousands more have utilized the laboratory's facilities for field trips.

Inquiries concerning the programs of study at the Marine Laboratory may be addressed to Admissions Office, Nicholas School of the Environment Marine Laboratory, Beaufort North Carolina 2851-9721; telephone 919-504-7502 or [hnearing@mail.duke.edu](mailto:hnearing@mail.duke.edu). Also please see the Marine Lab's World Wide Web page for more information: <http://www.env.duke.edu/marinelab/marine.html>. The director of undergraduate studies and the director of graduate studies are available for consultation.

## Course Offerings

The following lists courses normally taught at the laboratory during the designated semester or summer term. For course descriptions and credits, see the course section of this bulletin. Courses numbered 100 to 199 are undergraduate courses. Courses numbered 200 and above are graduate level; however, some 200-level courses are open to undergraduates. Laboratory courses are designated with an (L) appended to the course number; seminars are normally designated with an (S); exceptions, however, occur. Because course offerings are subject to change, students should consult the university course schedule before deciding upon registration.



## THE "BEAUFORT TO BERMUDA" SEMESTER

The Marine Laboratory (Beaufort, N.C.) in partnership with the Bermuda Biological Station for Research (Ferry Reach, Bermuda) offers a one-semester international study in environmental science and policy at two distinctive locations: Beaufort on the North Carolina coastal plain with its marshlands, estuaries, continental shelf, and the Gulf Stream; Bermuda with its intertidal coral reefs and subtropical mid-ocean environment in the Sargasso Sea. Emphasis will be placed on the rigorous application of the natural and social sciences to the contrasting marine ecosystems and to basic processes and human interventions in the coastal and oceanic systems. The program draws from two marine laboratory traditions in experiential learning for undergraduates and from the expertise of two resident faculties.

The program occurs only during the spring semester and is designed for college juniors and seniors who have adequate preparation in the natural and social sciences. Students will reside at each campus for one-half semester. During the compressed seven-week session at each campus, they will take two intensive courses selected from the curriculum offered at each campus. One group will begin the program in Beaufort, the other in Bermuda. At mid-semester the groups will trade campuses. Enrollment is limited. Early application is strongly recommended.

For further information, contact the Admissions Office (919/504-7502, [hnearing@mail.duke.edu](mailto:hnearing@mail.duke.edu)) or the Beaufort2Bermuda World Wide Web page <http://www.env.duke.edu/marinelab/bermpg1.html>.



## FALL SEMESTER

Analysis of Ocean Ecosystems (BIO 123/ENV 293)  
Marine Mammals (BIO 126/ENV 226)  
Marine Ecology (BIO 129L/ENV 219L/ZOO 203L)  
Physiology of Marine Animals (BIO 150L/ENV 228L)  
Biochemistry of Marine Animals (BIO 155L/ENV 229L)  
Marine Invertebrate Zoology (BIO 176L/ENV 295L)  
Marine Animal Navigation (BIO 295S.08/ZOO 295S.08)  
Light in the Sea (BIO 295S.24)  
Environmental Biochemistry (CBI 243/ENV 243)  
Molecular and Cellular Processes in Marine Organisms (CBI 244L/ENV 244L)  
Marine Policy (ENV 276/PPS 197)  
Geological Oceanography (GEO 205/ENV 291)  
Independent Study (BIO/ENV/GEO 191)  
Tutorials (BIO 193T, 194T)  
Independent Study for Nonmajors (GEO 195)  
Graduate research and tutorial courses in various departments are also available.

## SPRING SEMESTER

### *Beaufort Courses*

Biological Oceanography (BIO 114L/ENV 292L)  
Marine Mammals (BIO 126/ENV 226)  
Biochemistry of Marine Animals (BIO 155L/ENV 229L)  
The Ecology of Chemical Signals (BIO 296S.26/ZOO 296S.26)  
Human Impact on the Natural Environment (BIO 296S.54)  
Estuarine Ecosystem Processes (ENV 208L)  
Coastal Ecotoxicology and Pollution (ENV 225L)  
Seminar in Ocean Sciences (ENV 256S)  
Advanced Topics in Marine Ecology (ENV 269S/ZOO 264S)  
Marine Fisheries Policy (ENV 273)  
Seminar in Coastal Environmental Management (ENV 398.02)  
Independent Study (BIO/ENV 192) Student must remain in Beaufort the entire term.  
Tutorials (BIO 193T, 194T)  
Graduate research and tutorial courses in various departments are also available.

### *Bermuda courses*

Biological Oceanography (BIO 114L/ENV 292L)  
Marine Ecology (BIO 129L/ENV 219L/ZOO 203L)  
Marine Invertebrate Zoology (BIO 176L/ENV 295L/ZOO 274L)  
Climate Change: A Global Perspective (ENV 121)  
Climate Related Hazards and Humanity (ENV 122S)  
Remote Sensing and Long-term Environmental Monitoring (ENV 125)  
Current Topics in Oceanography and Marine Biology (ENV 132S)  
Molecular Approaches to Questions of Physiology, Ecology and Evolution in the Marine Environment (ENV 133S)  
Biological Cycles in the Ocean (ENV 134L)  
A Scientist's Perspective on Environmental Principles, Policy, and Legislation (ENV 140)

## FIRST SUMMER TERM

Marine Biology (BIO 10L)

Biological Oceanography (BIO 114L/ENV 292L)  
Physiology of Marine Animals (BIO 150L/ENV 228L)  
Biochemistry of Marine Animals (BIO 155L/ENV 229L)  
Marine Invertebrate Zoology (BIO 176L/ENV 295L)  
Cellular and Molecular Research Techniques (CBI 244L/ENV 244L)  
Independent Study (BIO/ENV 191; CBI 210)  
Tutorials (BIO 193T, 194T)

Graduate research and tutorial courses in various departments are also available.

## SECOND SUMMER TERM

Marine Mammals (BIO 126L/ENV 226L)  
Marine Ecology (BIO 129L/ENV 219L/ZOO 203L)  
Marine Invertebrate Zoology (BIO 176L/ENV 295L)  
Barrier Island Ecology (BIO 218L/BOT 218L/ENV 203L)  
Estuarine Ecosystem Processes (ENV 208L)  
Conservation Biology and Policy (ENV 209)  
Marine Policy (ENV 276/PPS 197)  
Independent Study (BIO/ENV 192; CBI 210)  
Tutorials (BIO 193T, 194T)

Graduate research and tutorial courses in various departments are also available. Additional courses may be offered.

## Application for Enrollment

Application forms for enrollment in semester programs or summer terms at the Marine Laboratory are found at the back of this publication and on the World Wide Web at <http://www.env.duke.edu/marinelab/marine.html>. Admission to Marine Laboratory programs does not constitute admission to undergraduate, professional, or graduate degree programs at Duke University. For further information, see the chapter on admission and financial aid in this bulletin.

Students seeking admission to degree programs at Duke should write or call the appropriate school or department admissions office.

## Programs Offered at Duke that Relate to the Marine Laboratory

### UNDERGRADUATE DEGREE PROGRAMS

Information and application materials on undergraduate degree programs offered at Duke are found in the *Bulletin of Information for Prospective Students* and the *Bulletin of Duke University-Undergraduate Instruction*, including information on available majors and financial aid. To obtain application materials and information, contact: Office of Undergraduate Admissions, 2138 Campus Drive, Duke University, Box 90586, Durham, North Carolina 27708-0586; telephone 919-684-3214.

Undergraduate majors that relate to ocean studies are listed below and detailed in the *Bulletin of Duke University-Undergraduate Instruction*; additional information is also available as follows:

**Biology Major.** (An area of concentration in marine biology includes a semester or summer session at Duke Marine Laboratory): Director of Undergraduate Studies in Biology, Biological Sciences Building, Duke University, Box 90324, Durham, North Carolina 27708-0324; telephone 919-660-7320.

NOTE: Duke students are directed to literature in the Undergraduate Studies Office, Biology Major Program (Biological Sciences Building) for information about



requirements fulfilled by courses at the Marine Laboratory for the biology major.

**Environmental Sciences and Policy Major.** (Field experiences may include a semester or summer session at Duke Marine Laboratory): Director of Undergraduate Studies, Nicholas School of the Environment, Levine Science Research Center, Duke University, Box 90328, Durham, North Carolina 27708-0328; telephone 919-613-8060.

**Geology Major.** (A marine geology option includes a semester at Duke Marine Laboratory): Director of Undergraduate Studies, Department of Geology, Old Chemistry Building, Duke University, Box 90230, Durham, North Carolina 27708-0230; telephone 919-684-5847.

## PROFESSIONAL DEGREE PROGRAMS

The Nicholas School of the Environment offers a Master of Environmental Management (M.E.M.) degree with a program concentration in Coastal Environmental Management. This program usually entails a first year of study on the Durham campus, and a second year of study at the Duke Marine Laboratory. The program is tailored to individual interests and includes courses in both the natural and social sciences. It is described in the *Bulletin of Duke University-Nicholas School of the Environment*. Application is made through the Nicholas School of the Environment, Durham campus. Additionally, students in other professional degree programs within the Nicholas School of the Environment often take courses offered at the Marine Laboratory.

**Professional Program Applications.** Enrollment Services, Nicholas School of the Environment, A142 Levine Science Research Center, Duke University, Box 90330, Durham, North Carolina 27708-330; telephone 919-613-8070.

**Coastal Environmental Management Program Information.** Dr. Michael K. Orbach, Director, Coastal Environmental Management Program, Duke University Nicholas School of the Environment Marine Laboratory, 135 Duke Marine Lab Road, Beaufort, North Carolina 28516-9721; telephone 919-504-7605.

## GRADUATE DEGREE PROGRAMS

Graduate students from all academic disciplines are encouraged to study at the Marine Laboratory year-round. Graduate degree candidates may take advantage of course work in the marine sciences as well as coastal and marine policy, an active seminar program, and facilities supporting dissertation research.

Resident graduate students represent the Nicholas School of the Environment and the Departments of Botany, Cell Biology, and Zoology. Ordinarily, dissertation advisers are resident as well. Although residency of the advisor is not necessary to study at the Marine Laboratory, some sources of funding are contingent upon an advisor from the laboratory's resident faculty. Students in graduate programs may elect to spend a year or more at the Durham campus before taking residence at the Marine Laboratory; however, residence in Durham is not a requirement.

The Marine Laboratory awards full-time fellowships which pay a stipend, tuition, and fees. Students are required to serve as a teaching assistant for two courses for each academic year's payment. Tuition credits obtained from fellowship support may be applied to courses given both at the Marine Laboratory and the Durham campus, regular semesters and summer terms.

Application should be made through the Graduate School. Additional information is available from the director of graduate studies in the department of interest (see below), as well as from the director of graduate studies at the Marine Laboratory. Also, consult the current *Duke Graduate School Bulletin of Information for Graduate Studies*, the *Bulletin of Duke University-Graduate School*, and the *Bulletin of Duke University-Medical School*.

Within the Duke Graduate School, specialization in marine science may be



conducted through the following departments: Botany (A.M. [nonthesis], M.S. [thesis, and Ph.D.]; Cell Biology (Ph.D.); Environment (Ph.D.; M.S. available as part of a Ph.D. program; Ph.D. may include focus on coastal and marine policy); or Zoology (Ph.D.; A.M. or M.S. degree may be taken by students en route to the Ph.D., or by those who leave the doctoral program).

**Graduate School Applications.** Office of Graduate Admissions, Graduate School, 127 Allen Building, Duke University, Box 90063, Durham, North Carolina 27708-0063; telephone 919-684-3913.

**For further information on Graduate Programs:**

**Botany.** Director of Graduate Studies, Department of Botany, 139 Biological Sciences Building, Duke University, Box 90342, Durham, North Carolina 27708-0342; telephone 919-684-6518.

**Cell Biology.** Director of Graduate Studies, Department of Cell Biology, Duke University Medical Center, Box 3011, Durham, North Carolina 27710; telephone 919-684-5207.

**Environment.** Enrollment Services, Nicholas School of the Environment, A142 Levine Science Research Center, Duke University, Box 90330, Durham, North Carolina 27708-0330; telephone 919-613-8070.

**Marine Laboratory.** Director of Graduate Studies, Duke University Nicholas School of the Environment Marine Laboratory, 135 Duke Marine Lab Road, Beaufort, North Carolina 28516-9721; telephone 919-504-7502.

**Zoology.** Director of Graduate Studies, Department of Zoology, 108 Biological Sciences Building, Duke University, Box 90325, Durham, North Carolina 27708-0325; telephone 919-684-3649 or 684-2507.



## INTEGRATED TOXICOLOGY PROGRAM

Duke University offers an interdisciplinary doctoral and postdoctoral program in human and environmental toxicology. The Integrated Toxicology Program faculty comprises members of the Departments of Anesthesiology, Biochemistry, Cellular and Molecular Biology, Chemistry, Medicine, Neurobiology, Pathology, Pharmacology, and the Nicholas School of the Environment (Durham and Marine Laboratory campuses). Students seeking admission to the program as a Ph.D. candidate make initial application to the Graduate School for admission to a specific department.

Research in environmental toxicology in the Nicholas School of the Environment focuses on molecular and biochemical aspects of pollutant metabolism, adaptation, and modes of toxic action. The majority of this work employs freshwater, marine, and terrestrial organisms as toxicological models. The goals are to achieve fundamental understanding of processes governing the fates and effects of contaminants in ecosystems, and to elucidate linkages between ecosystem and human health.

Training in environmental toxicology is available to professional students through the Master of Environmental Management (M.E.M.) program in Environmental Toxicology, Chemistry and Risk Assessment in the Nicholas School of the Environment.

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## *Admission and Registration*



## Fall and Spring Semester Programs

The semester programs are designed for college juniors and seniors and graduate students who wish to enroll in courses offered during the spring or fall. Students from any college or university may apply. Students intending to apply to the semester programs should have completed college courses in introductory biology, chemistry, and mathematics. Applications should be received by mid-October for the spring semester and by mid-March for the fall semester; however, applications are considered in the order in which they arrive. Applications received after the deadline will be considered if space is available.

For undergraduates, a full program of study ordinarily consists of courses totaling four course credits.

### SEMESTER PROGRAM ADMISSION

**Duke Undergraduates.** Duke students must submit the semester program application (found at the back of this publication or on the World Wide Web at <http://www.env.duke.edu/marinelab/marine.html>) to the Admissions Office of the Marine Laboratory prior to Duke's registration period for the desired semester. Notification of admission will be sent to the applicant as well as the Duke Registrar's Office. Students will then need to register at the normal designated time through ACES (Automated Computer Enrollment System).

**Duke Graduate Students.** Students enrolled in a graduate degree program at Duke who wish to enroll in semester program courses offered at the Marine Laboratory should notify the Marine Laboratory Admissions Office of such intent and specify the courses of enrollment prior to Duke's registration period for that semester. Students will need to register through ACES at the normal designated time.

**Non-Duke Undergraduates.** Non-Duke students must submit the semester program application (found at the back of this publication), one letter of recommendation from faculty at their home institution, and a current academic transcript to the Admissions Office of the Marine Laboratory. Upon receipt of these credentials, the application will be processed for admission and notification will be sent to the applicant. Students will be categorized as nondegree (unclassified) students and registered for the specific semester at Duke.



## Summer Programs

Summer courses offered at the Marine Laboratory are open to qualified college undergraduates, graduate students, and individuals who already hold an undergraduate or graduate degree. The summer program is not open to high school students.

Introductory-level courses are numbered below 100; advanced-level courses are numbered 100 and above. Courses numbered from 200 to 299 are primarily for advanced undergraduates and graduate students; undergraduates may not enroll in courses numbered 300 or higher. The predominant prerequisites for the summer courses are introductory college biology and/or chemistry. Other prerequisites may be required. These are listed in the specific course description.

Individuals interested in enrolling in courses offered during the first summer term are advised to submit their application and supporting credentials during late fall or early winter to assure space in the desired course. Many courses reach maximum enrollment early in the admissions process.

Individuals may apply for admission to one or both of the summer terms.

**Summer Credit.** The summer session credit does not mean degree credit at Duke University unless the student has been admitted as a degree candidate by one of the colleges or schools of the university. Other students will be categorized as nondegree (unclassified) students for the summer only. A student taking a course for credit is expected to complete all of the work required and to take the final examination, and will receive a grade.

**Summer Minimum Enrollment.** Some courses are offered subject to minimum enrollments. Should it become necessary to withdraw a course not having adequate enrollment, every effort will be made to place the student in an alternate course that has been listed by the student as a second choice.

**Summer Maximum Enrollment.** If a course reaches maximum enrollment, subsequent applicants will be placed on a waiting list. Applicants should list first and second choice course preferences on their application. It is advisable for students applying to the first summer term to apply during late fall or early winter.

**Summer Maximum Course Load.** Students register for only one course during the first summer term. However, during the second summer term students are encouraged to register for Conservation Biology and Policy (ENV 209) and one additional course.

### SUMMER PROGRAM ADMISSION

The summer application (found at the back of this publication or on the World Wide Web at <http://www.env.duke.edu/marinelab/marine.html>) must be submitted to the Marine Laboratory Admissions Office by all individuals applying to undergraduate and graduate courses or graduate graded research to be conducted at the Marine Laboratory. A current academic transcript is required to complete the application. These credentials may be sent separately or together.

Upon receipt of all credentials, the application will be processed for admission and notification will be sent to the applicant. Applicants are encouraged to apply early to allow for adequate processing time and to gain admission in the desired course(s). Upon acceptance, payment of the required deposit(s) is essential to reserve space in a course as well as room and board accommodations.

Duke students should note that ACES will not be available for summer course registration at the Marine Laboratory. Registration information will be provided to the Duke Registrar's Office at the appropriate time.

## Immunization Requirement (Semester and Summer Programs)

The North Carolina immunization law requires students attending a college or university in the state to be immunized against the following diseases: measles, rubella, tetanus, diphtheria, and, in some cases, polio. Students from institutions other than Duke are required to present proof of these immunizations in accordance with the instructions contained in the Student Health Services form provided with the student's admissions materials. This form should be completed and returned to Student Health Services prior to the student's first day of classes. Duke University cannot permit a student to attend classes unless the required immunizations have been obtained.

## Transcripts of Academic Work Conducted at the Marine Laboratory (Semester and Summer Programs)

Requests for official transcripts of course work completed at the Marine Laboratory should be directed to the Office of the Registrar, 103 Allen Building, Duke University, Box 90055, Durham, North Carolina 27708-0055. Requests may also be made by fax (919-684-4500; no cover sheet is necessary). The fax machine is on twenty-four hours/day, seven days/week. The request must include name, social security number, home institution, term and year of attendance at Marine Lab, address to which the transcript should be sent, and written signature. Transcript requests should not be directed to the Marine Laboratory.

The registrar **cannot** fax transcripts. Ten days should be allowed for processing.

Transcripts may be withheld for an individual whose student loan account is past due. Non-Duke students are charged a one-time \$30 fee (fall or spring term) or \$15 fee (summer term) for transcripts.



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*Financial Information*



The semester program figures quoted in this section are based on costs applicable in academic year 1997-98 and are projections in some cases; they may be subject to change without prior notice.

## Fall and Spring Semester Programs

Costs for undergraduate students, per semester:

|   |          |
|---|----------|
| Tuition   | \$10,775 |
| Room and board  | 3,295    |
| Books (estimated)   | 450      |
| Health fee  | 208      |
| Student activity fee  | 60       |
| Residential License Fee (security deposit)                  | 100      |
| Transcript fee for nonDuke students                         | 30       |
| Airfare (if attending Beaufort to Bermuda program)          | varies   |
| Insurance policy (if attending Beaufort to Bermuda program) | 30       |
| Key deposit   | 10       |
| Phone deposit (long distance privileges)                    | 20       |

**Room and Board.** All dormitory occupants must supply their own linens, blankets, towels, and pillows. A key deposit of \$10 (per semester) will be charged each person occupying a room. This deposit will be refunded at the time of departure and return of key. A residential license fee (security deposit) of \$100 (per semester) will be charged each person occupying a room. It will be refunded within 90 days after departure from the Marine Lab less any outstanding fees incurred in accordance with the established University policy. Charges in excess of the housing deposit shall be assessed to the student.

Full board provides for three meals each day. No credit will be allowed for meals that are missed. However, board is adjusted for holidays (i.e., students may stay in the dormitory during breaks and Thanksgiving holidays but the dining hall is not open). Rooms are paid for from the terms' beginning to end.

**Books.** Books, if required by the instructor, will be available after arrival.

**Payment of Tuition and Fees.** The Office of the Bursar (Duke University, Durham campus) will issue invoices to registered students for tuition, fees, and other charges approximately four to six weeks prior to the beginning of classes each semester. The total amount due on the invoice is payable by the invoice late payment date which is normally one week prior to the beginning of classes. Inquire at the Office of the Bursar, 919-3531, if an invoice has not been received three weeks prior to the first day of classes, so that payment can be forwarded while a duplicate invoice is issued to document the balance owed.



As part of the admission agreement with Duke University, a student is required to pay all invoices as presented. If full payment is not received, a late payment charge as described below will be assessed on the next invoice. Failure to receive an invoice does not warrant exemption from the payment of tuition and fees nor from the penalties and restrictions. Nonregistered students will be required to make payment for tuition, fees, required deposits, and any past due balance at the time of registration. Payments should be sent to the address indicated on the invoice and not to the Duke Marine Laboratory.

**Late Payment Charge.** If the total amount due on an invoice is not received by the invoice late payment date, the next invoice will show a penalty charge of 1 and 1/4 percent per month assessed on the past due balance regardless of the number of days past due. The past due balance is defined as the previous balance less any payments and credits received on or before the late payment date and also any student loan or scholarship memo credits related to the previous balance which appear on the invoice.

## Refunds

**Fall and Spring.** In the case of withdrawal from the university, students or their parents may elect to have tuition refunded or carried forward as a credit for later study according to the following schedule:

| Withdrawal                          | Refund      |
|-------------------------------------|-------------|
| Before classes begin                | Full amount |
| During first or second week         | 80 percent  |
| During third, fourth, or fifth week | 60 percent  |
| During sixth week                   | 20 percent  |
| After sixth week                    | None        |

Tuition charges paid from grants or loans will be restored to those funds on the same pro rata basis and will not be refunded or carried forward. In addition to tuition, the schedule also applies to other Marine Laboratory fees. Consult the *Bulletin of Duke University-Undergraduate Instruction* for additional information.

## Summer Programs

The following charges are applicable for undergraduate and graduate 1998 summer registration, per term. Please direct all financial inquiries for summer session fees to the Marine Lab (Ms. Lynk 919/504-7527 or Ms. Gagnon 919/504-7525) as the Durham campus Bursar's Office does not have current information for housing, board, or other Marine Lab fees.

|  |            |
|--|------------|
| Tuition                                    | \$520/s.h. |
| • each one and one-half course (6 s.h.)    | \$3,120    |
| • each course (laboratory-4 s.h.)          | 2,080      |
| • each course (nonlaboratory-3 s.h.)       | 1,560      |
| Health fee                                 | 63         |
| Room and board                             | 1,100      |
| Transcript fee for nonDuke students        | 15         |
| Key deposit                                | 10         |
| Phone deposit (long distance privileges)   | 20         |
| Books (estimated)                          | 200        |
| Residential License Fee (security deposit) | 100        |

### **Auditing Fees.**

1. With permission of the instructor and the director, students registered for a full program (6 s.h.) may audit courses. No extra charge is made.

2. Students carrying less than a full program (6 s.h.) may be granted permission by the instructor and the director to audit a course, but must pay half the university fee for the course.

**Room and Board.** Total charges for room and board are estimated at \$1,100. Reservations are made on a first-come, first-served basis. Upon acceptance in a course, students will be sent an acceptance and reservation form which should be promptly returned to the Marine Laboratory along with the required deposits.

All dormitory rooms are air-conditioned. Occupants must supply their own linens, blankets, towels, and pillows. Full board provides for three meals each day. There will be no credit allowed for missed meals.

**Books.** Books, if required by the instructor, will be available at registration.

### **Deposits.**

1. **Course Deposit.** Upon acceptance in a course, a nonrefundable deposit of \$150 (per course) is required to ensure a reservation in that course. If the student properly registers for the course and attends, the deposit will be credited to tuition.

2. **Room and Board Deposit.** A \$100 deposit (per summer term) is required to ensure a reservation for room and board. If the student properly registers, the deposit will be credited to the room and board charge. The deposit is refundable if, PRIOR to the beginning of the term, a student who has previously made a room and board reservation notifies the Marine Lab in writing that he/she is withdrawing from the course. The deposit is nonrefundable if a student who has previously made a room and board reservation at the Marine Laboratory subsequently decides to attend the term but not utilize Marine Lab room and board facilities (although he or she still plans to attend the course) and does not notify the Marine Laboratory at least two weeks prior to the beginning of the term.

3. **Key Deposit.** A key deposit of \$10 per summer term will be charged each person occupying a dormitory room. This deposit will be refunded at time of departure and return of the key.

4. **Phone Deposit.** Each student requesting a personal phone code for making long distance calls is required to make this \$20 deposit. It will be refunded when all personal phone charges are paid in full.

**Payment of Tuition and Fees.** Duke University Marine Laboratory does not mail statements for summer term tuition and fees. All tuition and fees (which students must calculate from the information in their admissions materials) must be paid to the Accounting Office, Duke University Nicholas School of the Environment Marine Laboratory, 135 Duke Marine Lab Road, Beaufort, North Carolina 28516-9721 on or before the Friday preceding the beginning of each summer term (see Duke University Marine Laboratory calendar for term dates). Checks should be made payable to Duke University Marine Laboratory and may be mailed to the above address.

Students who plan to pay for summer tuition and/or fees, or a portion thereof, through other than personal means or scholarship support provided by Duke Marine Laboratory, such as student loans or other types of financial assistance not provided by the Marine Laboratory, should notify the Duke Marine Laboratory Accounting Office (919/504-7527) prior to the payment due date and specify their form of payment. Such students must bring with them to the Marine Laboratory copies of any documents, such as approved student loans, etc., which relate to the payment of Duke Marine Laboratory

summer tuition and fees.

Failure to pay summer tuition and fees by the end of the drop/add period (*the third day of classes in any term*) will result in administrative withdrawal of the student. These withdrawn students will be billed the health fee and an administrative withdrawal fee of \$225 (per 6 semester hour course), \$150 (per 3-4 semester hour course), or \$75 (per 2 semester hour course). Students who, subsequent to withdrawal, clear with the Marine Laboratory Accounting Office may, with written permission of their academic dean, be reinstated in their classes as originally registered. The administrative withdrawal fee will stand and the student will be liable for full tuition and fees. Students who are unable to meet these deadlines should consult with the Marine Laboratory Accounting Office and their academic dean (in the case of Duke University students) prior to the deadline.

**Late Payment Charge.** Students who fail to pay all tuition and fees on or before the Friday preceding the beginning of each term will pay an extra charge of \$100.

**Summer Term Refunds—Drop or Administrative Withdrawal Charges and Refund of Tuition and Fees.** Students who will not be attending a summer term or course for which they have been officially registered must drop the course(s) prior to the beginning of the term whether or not they have paid tuition and fees. Students who fail to drop the course(s) prior to the beginning of the term will be charged \$225 (per 6 semester hour course), \$150 (per 3-4 semester hour course), or \$75 (per 2 semester hour course).

Students who will not be attending a summer term or course for which tuition and fees have been paid are eligible for refunds following these policies:

1. There is a financial obligation of full tuition and fees if the student drops a course(s) or withdraws from the term after the third day. After the first week of the term, the room and board fee less the cost of each week of room and board (a week of room and board is considered Sunday-Saturday) is refunded.

2. There is a financial obligation of \$225 (for a 6 semester hour course), \$150 (for a 3-4 semester hour course), or \$75 (for a 2 semester hour course) if the student officially drops a course(s) or withdraws from the term during the first three days. The health fee is not refunded. The room and board fee less the cost of one week of room and board will also be refunded. (There is no charge for drop/adds that result in no change in course load in the same term.)

3. Full tuition and fees are refunded if the student officially drops a course(s) or withdraws from the term before the first day.

## Check Cashing

The banks in the Beaufort-Morehead City area have indicated that they will not cash personal checks for students unless the checks are guaranteed. Therefore, it is recommended that students who come to the laboratory bring with them sufficient travelers' checks, money orders, certified checks (which the banks will cash), or cash to cover personal expenses. The Marine Laboratory will accept personal checks to pay course fees and other accounts, but cannot convert personal checks for cash purposes. Additionally, the Marine Laboratory cannot accept credit cards for payment of accounts.

# Financial Assistance

## UNDERGRADUATE FINANCIAL AID

Financial aid is generally available to Duke University undergraduate students for each summer term. Interested students can obtain specific details on available funding and an application through the Duke University Financial Aid Office (Durham campus) in March of each year.

## SUMMER TUITION SCHOLARSHIPS FOR UNDERGRADUATE AND GRADUATE STUDENTS

The summer tuition scholarships listed below are awarded on a competitive basis by the Marine Laboratory. Each award provides tuition for one course taken during the summer. Awards require that undergraduates live on campus, i.e., take room and board at the Marine Laboratory. The criteria used in review of scholarship applicants are academic excellence, scope of preparation, professional goals, and need. Awardees are selected by the Marine Laboratory faculty.

Preconditions for review of a scholarship application are admission to a specific summer course and submission of the \$150 course deposit. (Admission to courses does not automatically imply award of a scholarship; separate reviews are conducted.) A student may receive only one tuition scholarship/summer.

There is no separate scholarship application form. Intent to apply for a scholarship should be made known on the reverse of the summer course application found at the back of this publication or on the World Wide Web. In addition to the summer application for courses, each scholarship applicant is required to submit (1) college or professional school transcript(s), (2) a letter of recommendation from academic faculty and (3) a brief statement of purpose, i.e., the reason for taking the particular course. All scholarship credentials must be received no later than 1 March by the admissions office of the Marine Laboratory. All scholarship applicants will be notified by mail concerning their award status shortly after the deadline date.

**Lawrence E. Blanchard Endowment Fund.** The fund income is used to support undergraduate students in academic courses at the Duke University Marine Laboratory.

**Bookhout Scholarship.** The Bookhout Scholarship provides financial assistance to juniors, seniors, or beginning graduate students with a professional interest in the natural sciences.

**August A. Busch, Jr., Memorial Scholarship Fund.** The income provides unrestricted scholarship support for undergraduates studying at the Duke University Marine Laboratory.

**Laura J. Grierson Memorial Fund.** The fund income is used to support undergraduate students in academic independent study courses at the Duke University Marine Laboratory.

**Lawrence I'Anson Scholarship Endowment Fund.** The income provides unrestricted scholarship support for undergraduates studying at the Duke University Marine Laboratory.

**Melanie Elizabeth Lynn Memorial Scholarship.** The Melanie Elizabeth Lynn Memorial Scholarship provides financial assistance to female graduate students for summer academic course work.

**Marine Biomedical Center.** This scholarship provides support for undergraduate students studying at the Marine Laboratory.



**Mary Derrickson McCurdy Scholarship.** The Mary Derrickson McCurdy Scholarship provides financial assistance to undergraduate students for academic course work.

**Richard C. and Linda G. Seale Scholarship Endowment Fund.** The fund income is intended to provide support to qualified students from Denison University for participation in summer courses at the Duke Marine Laboratory. Denison University students interested in applying for this scholarship are directed to the Chairman, Department of Biology, at Denison University with respect to required supporting credentials and deadlines for application and award notification. Should there be no applicants from Denison, the scholarship may be used to provide financial assistance to any qualified student.

**Harvey W. Smith Undergraduate Fellowship in Biological Sciences.** The income from this fund is used to support undergraduate participation in academic courses.

**Deborah Susan Steer Memorial Scholarship in Marine-Life Sciences.** Each year the income from the fund is used to provide financial assistance to promising Duke undergraduates who wish to study marine life-sciences at the Duke University Marine Laboratory.

**John A. and Elizabeth F. Taylor Foundation Fellowship.** The fellowship provides support to rising junior science majors (either [1] enrolled in a Tampa Bay area college or university, or [2] whose home is in the Tampa Bay area but attending college away from home) for a two-summer training and research commitment. The first summer consists of training at the Duke University Marine Laboratory in formal course work and research in the marine sciences. The second summer consists of independent research on water quality or fisheries at the Clearwater Marine Science Center, Clearwater, Florida. The stipend provides for complete tuition, travel, and subsistence allowance for both summers. Applicants must submit (1) a letter of intent, including a statement of how the experience would strengthen the candidate's life goals; (2) college transcript(s); and (3) the names of three references, including addresses and phone numbers. The deadline for application is 1 February. Application materials should be submitted to Dr. Andrew J. Read, Duke University Nicholas School of the Environment Marine Laboratory, 135 Duke Marine Lab Road, Beaufort, North Carolina 2851-9721.

**The Wade Family Fund.** The income from this fund is used to support undergraduate and graduate student participation in academic courses.

## **FULL-TIME GRADUATE SUPPORT**

Full-time (academic year, including summer) graduate support is available to students registered in a graduate program at Duke University. Recipients usually reside in Beaufort after their course work is completed on the Durham campus and base their research at the Beaufort campus. Support is considered on a case-by-case basis and generally is guaranteed to students making satisfactory progress and whose advisors are resident at the Duke Marine Laboratory. Support is available in the form of Duke University Marine Laboratory instructional assistantships. Awards are made annually. Eligibility is for five years.

Applicants making satisfactory progress should submit a letter of request for support in response to the announcement of funding that is made to students and faculty in January or February of each year. Further documentation may be requested of students whose progress is uncertain. For further information, write the Director of Graduate Studies, Duke University Nicholas School of the Environment Marine Laboratory, 135 Duke Marine Lab Road, Beaufort, North Carolina 28516-9721.

## POSTDOCTORAL SUPPORT

**Mary Derrickson McCurdy Visiting Fellow.** To enhance the mission of the School of the Environment, Duke University seeks scholars-in-residence to enrich the emerging curriculum at the Marine Laboratory in ocean science aspects of issues related to the environment and living resources. Ideally, the scholar will teach an innovative seminar in the fall and spring semesters and perform collaborative research with students. The curriculum is designed for advanced undergraduate, professional and graduate students.

The funds available are ideal for a postdoctoral year or a sabbatical leave, and can be used for salary and research. Applicants should send a course prospectus, a research prospectus, a curriculum vitae and a list of references to the director of the Marine Laboratory by 1 January for the following academic year.



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*Additional Information for Visiting  
Scholars and Researchers*



The figures quoted in this chapter are applicable in academic year 1997-98 and are projections in some cases; they may be subject to change without prior notice.

## Visiting Scholar Programs

The exchange of knowledge is kept lively by several programs which bring distinguished scientists/educators to the Marine Laboratory. The Visiting Scholar Program brings lecturers for a period of several days on a monthly basis year-round. The Mary Derrickson McCurdy Visiting Fellow is in residence one year or more. The scholars, while in residence, lecture to the community at large as well as enrich specific research groups. For information on financial support for visiting scholars, see the section entitled Postdoctoral Support in the chapter, Financial Information.

**Research Space.** Research space, including seawater tables, is available on a limited basis for Duke University Marine Laboratory visitors. The typical size of a laboratory-office area is 100 square feet.

**Teaching Space.** Classrooms of various sizes are available throughout the year; however, first priority must be given to Marine Laboratory classes when they are in session. Compound or dissecting microscopes are available for a small additional fee.

**Room and Board** is available for a reasonable cost. Allowances will be made only for meals missed at the beginning and end of the stay.

**Boat Rentals.** The following boats are available to visiting researchers for collecting and instructional activities. The boats may be scheduled through the Marine Operations Office, however, first priority must be given to classes when they are in session. These rates are intended to partially defray the cost of operations and maintenance.



Charges apply to all research and teaching activities. Use of Duke University Marine Laboratory vessels for any sponsored research will be subject to charges.

| Boat Type  | Per Hour | Per Day | Per Week |
|--|----------|---------|----------|
| 57-ft research/training<br>(R/V <i>Susan Hudson</i> )* | \$70     | \$450   | \$9,000  |
| 24-ft outboard runabout (1)                            | 35       | 240     | 1,000    |
| 20-ft. outboard runabout (1)                           | 25       | 175     | 800      |
| 16-ft. outboard runabout                               | 20       | 140     | 600      |
| 13-ft. Boston Whaler (3)                               | 6        | 40      | 175      |

**Off-Campus Housing.** The Bradley International House, a complex of seven apartment units, is operated by the Marine Laboratory to accommodate visiting researchers and instructors. It is located within walking distance of the Marine Laboratory and in the historic district of the town of Beaufort. The complex was designed to promote collegiality among academics and to enhance the historic district. The Bradley International House was dedicated in 1992, and was constructed with funds provided by the Lynde and Harry Bradley Foundation of Milwaukee, Wisconsin.

The units are fully furnished, including linens and utensils. The preferred occupancy is one month or more.

**Information and Reservations.** All requests for use of facilities or equipment at the Marine Laboratory, including the Bradley International House, should be addressed to Auxiliaries and Administrative Services, Duke University Nicholas School of the Environment Marine Laboratory, 135 Duke Marine Lab Road, Beaufort, North Carolina 28516-9721; telephone (919) 504-7504 or e-mail [cba@mail.duke.edu](mailto:cba@mail.duke.edu). Requests for the use of boats should be scheduled through Karen Ashley (919) 504-7583 or e-mail [karena@duncoc.ml.duke.edu](mailto:karena@duncoc.ml.duke.edu).

Please visit our home page for additional information: <http://www.env.duke.edu/marinelab/marine.html>.

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\*The *Susan Hudson* rents for \$1,500 for more than 12 hours and less than 24 hours.



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*Courses of Instruction*



## Courses Taught at the Marine Laboratory

Course offerings are subject to change. The student should consult the current university course schedule for listings of courses to be offered each semester or summer term.

### Biology

**10L. Marine Biology.** Physical and chemical characteristics of marine ecosystems and the functional adaptations of marine organisms to these systems. Lectures, field trips, and laboratories. For students not majoring in a natural science. (Given at Beaufort.) C-L: Marine Sciences. One course. *Kenney*

**114L. Biological Oceanography.** Physical, chemical, and biological processes of the oceans, emphasizing special adaptations for life in the sea and factors controlling distribution and abundance of organisms. One course (spring); one and one-half courses (summer). (Given at Beaufort and Bermuda.) Prerequisite: Biology 25L. C-L: Marine Sciences. Variable credit. *Ramus or staff (Beaufort); Nelson and Steinberg (Bermuda)*

**123. Analysis of Ocean Ecosystems.** The history, utility, and heuristic value of the ecosystem; ocean systems in the context of Odum's ecosystem concept; structure and function of the earth's major ecosystems. (Given at Beaufort.) Prerequisite: one year of biology, one year of chemistry, or consent of instructor. C-L: Marine Sciences. One course. *Barber*

**126. Marine Mammals.** Ecology, social organization, behavior, acoustic communication, and management issues. Focused on marine mammals in the southeastern United States (for example, bottlenose dolphin, right whale, West Indian



manatee). (Given at Beaufort.) Prerequisite: introductory biology. C-L: Marine Sciences. One course. *Read or staff*

**126L. Marine Mammals.** Laboratory version of Biology 126. Laboratory exercises consider social organization and acoustic communication in the local bottlenose dolphin population. (Given at Beaufort.) Prerequisite: introductory biology. C-L: Marine Sciences. One course. *Read or staff*

**129L. Marine Ecology.** Factors that influence the distribution, abundance, and diversity of marine organisms. Course structure integrates lectures, field excursions, and independent research projects. Topics include characteristics of marine habitats, adaptation to environment, species interactions, biogeography, larval recruitment, rocky shores, marine mammals, fouling communities, tidal flats, beaches, subtidal communities, and coral reefs. Not open to students who have taken Biology 203L. (Given at Beaufort.) Prerequisite: none; suggested—introductory ecology, invertebrate zoology, or marine botany. C-L: Marine Sciences. One course. *Staff*

**150L. Physiology of Marine Animals.** Environmental factors, biological rhythms, and behavioral adaptations in the comparative physiology of marine animals. One course (fall); one and one-half courses (summer). (Given at Beaufort.) Prerequisites: Biology 25L and Chemistry 12L. C-L: Marine Sciences. Variable credit. *Forward*

**155L. Biochemistry of Marine Animals.** Functional, structural, and evolutionary relationships of biochemical processes of importance to marine organisms. One course (fall and spring); one and one-half courses (summer). (Given at Beaufort.) Prerequisites: Biology 25L; and Chemistry 11L, 12L. C-L: Marine Sciences. Variable credit. *Rittschof*

**176L. Marine Invertebrate Zoology.** Structure, function, and development of invertebrates collected from estuarine and marine habitats. Not open to students who have taken Biology or Zoology 274L. One course (fall and Summer Term II); one and one-half courses (Summer Term I). (Given at Beaufort.) Prerequisite: Biology 25L. C-L: Marine Sciences. Variable credit. *Dimock (visiting summer faculty) or Kirby-Smith (environment)*

**191, 192. Independent Study.** Open to all qualified students with consent of supervising instructor and director of undergraduate studies. A maximum of three courses of 191, 192, 193T, and 194T may count toward the biology major. One course each. *Staff*

**193T, 194T. Tutorial.** For junior and senior majors with consent of director of undergraduate studies and supervising instructor. Three courses of 191, 192, 193T, and 194T, maximum. Variable credit. *Staff*

**218L. Barrier Island Ecology.** An integration of barrier island plant and animal ecology within the context of geomorphological change and human disturbance. Topics include: barrier island formation and migration, plant and animal adaptations, species interactions, dune succession, maritime forests, salt marshes, sea level rise, conservation policy, and restoration ecology. Field trips to many of the major North Carolina barrier islands. Strong emphasis on field observation and independent research (Given at Beaufort.) Prerequisite: Biology 25L or equivalent; suggested: course in botany or ecology. C-L: Environment 218L and Marine Sciences. One course. *Evans, Peterson, and Wells (visiting summer faculty)*

**295S, 296S. Seminar.** Variable credit. *Staff*

## **BIOLOGY COURSES CURRENTLY UNSCHEDULED**

**113L. Behavioral Ecology**

**274L. Biology of Marine Invertebrates**

## Botany

**218L. Barrier Island Ecology.** An integration of barrier island plant and animal ecology within the context of geomorphological change and human disturbance. Topics include: barrier island formation and migration, plant and animal adaptations, species interactions, dune succession, maritime forests, salt marshes, sea level rise, conservation policy, and restoration ecology. Field trips to many of the major North Carolina barrier islands. Strong emphasis on field observation and independent research. (Given at Beaufort.) Prerequisite: Biology 25L or equivalent; suggested: course in botany or ecology. C-L: Environment 218L and Marine Sciences. 4 units. *Evans, Peterson, and Wells (visiting summer faculty)*

**295S, 296S. Seminar.** Credit to be arranged. Variable credit. *Staff*

**359, 360. Research in Botany.** Individual investigation in the various fields of botany. Credit to be arranged. C-L: Marine Sciences. Variable credit. *All members of the graduate staff*

## Cell Biology

**210. Independent Study.** Directed reading and study in cell biology/physiology. Descriptions of specific areas may be obtained from the director of graduate studies. Consent of director of graduate studies required. 3 to 9 units each. C-L: Marine Sciences. Variable credit. *Staff*

**243. Environmental Biochemistry.** Introduction to the (macro)molecules of life and fundamental metabolic pathways. Topics are presented in the context of environmental perturbations. Fundamental aspects of energetics, proteins, enzymes, carbohydrates, lipids, and nucleic acids. Emphasis on mechanisms of adaptation, molecular controls, and responses to toxicants. (Given at Beaufort.) Prerequisite: organic chemistry. C-L: Environment 243 and Marine Sciences. One course or 3 units. *C. Bonaventura*

**244L. Molecular and Cellular Processes in Marine Organisms.** Joint research projects on the adverse effects of environmental pollutants on marine organisms at the cellular and molecular level. Research methodologies include: spectroscopy (UV/VIS, fluorescence, and atomic absorption); subcellular fractionation; protein purification and characterization using chromatography and electrophoresis; analysis of pollutant-induced damage to proteins, membranes, and DNA; measurement of activity of enzymatic defense systems. Lectures cover molecular mechanisms of damage and damage control, and concepts that underlie the methods to be used. (Given at Beaufort.) Prerequisite: organic chemistry. C-L: Environment 244L and Marine Sciences. One course or 4 units. *C. Bonaventura and McClellan-Green*

## Environment

**121. Climate Change: A Global Perspective.** Introduction to the scientific basis for prediction of global environmental change with emphasis on change in surface temperature, sea level, precipitation, and tropical cyclone activity. (Given at Bermuda.) Prerequisite: one year of chemistry. C-L: Marine Sciences. One course. *Malmquist and Murnane*

**122S. Climate-Related Hazards and Humanity.** The roles of science, politics, and business in quantifying and managing risks associated with climate-related hazards such as hurricanes. (Given at Bermuda.) C-L: Marine Sciences. Half course. *Malmquist*

**125. Remote Sensing and Long-term Environmental Monitoring.** Introduction to the theory and practice of environmental monitoring. Ocean biogeochemical cycles, tropical ecosystems, monitoring, and air and water pollution impact assessment and

monitoring. (Given at Bermuda.) C-L: Marine Sciences. One course. *Nelson*

**132S. Current Topics in Oceanography and Marine Biology.** Topics such as the Iron Hypothesis, toxic algal blooms, and UV light considered through readings in the primary literature and student presentations. (Given at Bermuda.) Prerequisite: introductory biology. C-L: Marine Sciences. Half course. *Staff*

**133S. Molecular Approaches to Questions of Physiology, Ecology, and Evolution in the Marine Environment.** (Given at Bermuda.) Prerequisite: introductory biology. C-L: Marine Sciences. Half course. *Trapido-Rosenthal*

**134L. Biological Cycles in the Ocean.** Biogeochemistry of carbon and nitrogen in the marine environment and associated laboratory techniques. Includes laboratory. (Given at Bermuda.) Prerequisites: introductory biology and introductory chemistry. C-L: Marine Sciences. One course. *Bates and Carlson*

**140. A Scientist's Perspective on Environmental Principles, Policy, and Legislation.** Bermuda's ecological, economic, sociopolitical systems, and environmental legislation as both a case study and as a comparative microcosm. Topics include: ecosystem conservation, natural resource management, pollution and waste management, and energy conservation and management. (Given at Bermuda.) C-L: Marine Sciences. One course. *Bates and Connelly*

**191,192. Independent Study.** Open to qualified juniors and seniors with consent of instructor and director of undergraduate studies. Variable credit. *Staff*

**208L. Estuarine Ecosystem Processes.** A study of the physical, chemical, and biological processes that control the structure of estuarine communities. Emphasis on field and laboratory techniques and data interpretation. (Given at Beaufort.) Prerequisite: ecology, systematics, or field biology course or consent of instructor. C-L: Marine Sciences. One course or 4 units. *Kirby-Smith*

**209. Conservation Biology and Policy.** Introduction to the key concepts of ecology and policy relevant to conservation issues at the population to ecosystems level. Focus on the origin and maintenance of biodiversity and conservation applications from both the biology and policy perspectives (for example, endangered species, captive breeding, reserve design, habitat fragmentation, ecosystem restoration/rehabilitation). Lectures and discussions integrate the science and policy issues and focus upon problem solving primarily, although not exclusively, in marine systems. Visiting scholars interact with students and supplement information provided by course faculty. (Given at Beaufort.) Prerequisite: introductory biology; suggested: a policy and/or introductory ecology course. C-L: Marine Sciences. One course or 3 units. *Crowder and Rubenstein*

**218L. Barrier Island Ecology.** An integration of barrier plant and animal ecology within the context of geomorphological change and human disturbance. Topics include: barrier island formation and migration, plant and animal adaptations, species interactions, dune succession, maritime forests, salt marshes, sea level rise, conservation policy, and restoration ecology. Field trips to many of the major North Carolina barrier islands. Strong emphasis on field observation and independent research. (Given at Beaufort.) Prerequisite: Biology 25L or equivalent; suggested: course in botany or ecology. C-L: Biology 218L, Botany 218L, and Marine Sciences. One course or 4 units. *Evans, Peterson, and Wells (visiting summer faculty)*

**219L. Marine Ecology.** Factors that influence the distribution, abundance, and diversity of marine organisms. Course structure integrates lectures, field excursions, and independent research projects. Topics include characteristics of marine habitats, adaptation to environment, species interactions, biogeography, larval recruitment,



rocky shores, marine mammals, fouling communities, tidal flats, beaches, subtidal communities, and coral reefs. Open to undergraduates only under Biology 129L. (Given at Beaufort.) Prerequisite: none; suggested—introductory ecology, invertebrate zoology, or marine botany. C-L: Marine Sciences and Zoology 203L. 4 units. *Staff*

**225L. Coastal Ecotoxicology and Pollution.** Principles of transport, fates, food-web dynamics and biological effects of pollutants in the marine environment. Laboratory to stress standard techniques for assessing pollutant levels and effects. (Given at Beaufort.) Prerequisites: introductory chemistry and biology. C-L: Marine Sciences. One course or 4 units. *Kenney*

**226. Marine Mammals.** Ecology, social organization, behavior, acoustic communication, and management issues. Focused on marine mammals in the southeastern United States (for example, bottlenose dolphin, right whale, West Indian manatee). Only open to undergraduates under Biology 126. (Given at Beaufort.) Prerequisite: introductory biology. C-L: Marine Sciences. 3 units. *Read or staff*

**226L. Marine Mammals.** Laboratory version of Environment 226. Laboratory exercises consider social organization and acoustic communication in the local bottlenose dolphin population (Given at Beaufort.) Prerequisite: introductory biology. C-L: Marine Sciences. 4 units. *Read or staff*

**228L. Physiology of Marine Animals.** Environmental factors, biological rhythms, and behavioral adaptations in the comparative physiology of marine animals. Open to undergraduates only under Biology 150L. Four units (fall); six units (summer). (Given at Beaufort.) Prerequisites: introductory biology and chemistry. C-L: Marine Sciences. Variable credit. *Forward*

**229L. Biochemistry of Marine Animals.** Functional, structural, and evolutionary relationships of biochemical processes of importance to marine organisms. Open to undergraduates only under Biology 155L. Four units (fall and spring); six units (summer). (Given at Beaufort.) Prerequisite: Biology 25L; Chemistry 11L, 12L. C-L: Marine Sciences. Variable credit. *Rittschof*

**243. Environmental Biochemistry.** Introduction to the (macro)molecules of life and fundamental metabolic pathways. Topics are presented in the context of environmental perturbations. Fundamental aspects of energetics, proteins, enzymes, carbohydrates, lipids, and nucleic acids. Emphasis on mechanisms of adaptation, molecular controls, and responses to toxicants. (Given at Beaufort.) Prerequisite: organic chemistry. C-L: Cell Biology 243 and Marine Sciences. One course or 3 units. *C. Bonaventura*

**244L. Molecular and Cellular Processes in Marine Organisms.** Joint research projects on the adverse effects of environmental pollutants on marine organisms at the cellular and molecular level. Research methodologies include: spectroscopy (UV/VIS, fluorescence, and atomic absorption); subcellular fractionation; protein purification and characterization using chromatography and electrophoresis; analysis of pollutant-induced damage to proteins, membranes, and DNA; measurement of activity of enzymatic defense systems. Lectures cover molecular mechanisms of damage and damage control, and concepts that underlie the methods to be used. (Given at Beaufort.) Prerequisite: organic chemistry. C-L: Cell Biology 244L and Marine Sciences. One course or 4 units. *C. Bonaventura and McClellan-Green*

**256S. Seminar in Ocean Sciences.** Biological, chemical, physical, and geological aspects of the ocean and their relation to environmental issues. Consent of instructor required. (Given at Beaufort.) C-L: Marine Sciences. Half course or 2 units. *Staff*



**269S. Advanced Topics in Marine Ecology.** Theoretical concepts from population, community, and evolutionary ecology will be linked to observations and experiments to enhance understanding of the structure and function of marine systems. Current topics in marine ecology (for example, marine food web dynamics, species interactions, life history strategies, fisheries ecology, conservation biology). Discussions will be based on readings from the primary literature with emphasis on developing critical and synthetic skills. Each student will prepare a research proposal in NSF format. May be repeated. (Given at Beaufort.) C-L: Zoology 264S and Marine Sciences. Half course or 2 units. *Crowder*

**273. Marine Fisheries Policy.** Principles, structure, and process of public policy-making for marine fisheries. Topics include local, regional, national, and international approaches to the management of marine fisheries. A social systems approach is used to analyze the biological, ecological, social, and economic aspects of the policy and management process. (Given at Beaufort.) C-L: Marine Sciences. One course or 3 units. *Orbach*

**276. Marine Policy.** Formal study of policy and policy-making concerning the coastal marine environment. History of specific marine-related organizations, legislation, and issues and their effects on local, regional, national, and international arenas. Topics explored through use of theoretical and methodological perspectives, including political science, sociology, and economics. Consent of instructor required. (Given at Beaufort.) C-L: Marine Sciences and Public Policy Studies 197. One course or 3 units. *Orbach*

**291. Geological Oceanography.** The geology of ocean basins, including origin, bottom physiography, sediment distribution, and sedimentary processes. Not open to students who have taken Geology 206S. (Given at Beaufort.) C-L: Geology 205 and Marine Sciences. One course or 3 units. *Staff*

**292L. Biological Oceanography.** Physical, chemical, and biological processes of the oceans, emphasizing special adaptations for life in the sea and factors controlling distribution and abundance of organisms. Only open to undergraduates under Biology 114L. Four units (spring); six units (summer). (Given at Beaufort and Bermuda.) Prerequisite: introductory biology. C-L: Marine Sciences. Variable credit. *Ramus or staff (Beaufort); Nelson and Steinberg (Bermuda)*

**293. Analysis of Ocean Ecosystems.** The history, utility, and heuristic value of the ecosystem; ocean systems in the context of Odum's ecosystem concept; structure and function of the earth's major ecosystems. Open to undergraduates only under Biology 123. (Given at Beaufort.) Prerequisite: one year of biology, one year of chemistry, or consent of instructor. C-L: Marine Sciences. 3 units. *Barber*

**295L. Marine Invertebrate Zoology.** Structure, function, and development of invertebrates collected from estuarine and marine habitats. Not open to students who have taken Biology or Zoology 274L. Open to undergraduates only under Biology 176L. Four units (fall and Summer Term II); six units (Summer Term I). (Given at Beaufort.) Prerequisite: introductory biology. C-L: Marine Sciences. Variable credit. *Dimock (visiting summer faculty) or Kirby-Smith (environment)*

**298. Special Topics.** Content to be determined each semester. May be repeated. Variable credit. *Staff*

**299. Independent Studies and Projects.** Directed readings or research at the graduate level to meet the needs of individual students. Consent of instructor required. Units to be arranged. Variable credit. *Staff*

**398. Program Area Seminar.** Required seminar in each program area. Students present master's project research. Pass/fail grading only. 1 unit. *Staff*

**399. Master's Project.** An applied study of a forestry or environmental management problem or a theoretical research effort. A seminar presentation of the objectives, methodology, and preliminary findings is required. A written (or other medium) report at the conclusion of the project is also required. Undertaken with the guidance of the student's adviser. Consent of instructor required. Pass/fail grading only. Variable credit. *Staff*

## ENVIRONMENT COURSES CURRENTLY UNSCHEDULED

222L. Physical Processes in Coastal Environments

223L. Behavioral Ecology

252L. Statistics and Data Analysis in Earth and Ocean Science

267S. Conservation Biology of Marine Mammals

268. Advanced Topics in Nearshore Processes

297L. Biology of Marine Invertebrates

## Geology

**191, 192. Independent Study.** Directed reading or research. Open only to qualified juniors and seniors by consent of director of undergraduate studies and supervising instructor. One course each or 3 units each. *Staff*

**195. Independent Study for Nonmajors.** Open to qualified juniors and seniors upon approval of the departmental faculty. One course or 3 units. *Staff*

**205. Geological Oceanography.** The geology of ocean basins, including origin, bottom physiography, sediment distribution, and sedimentary processes. Not open to students who have taken Geology 206S. (Given at Beaufort.) C-L: Environment 291 and Marine Sciences. One course or 3 units. *Staff*

**371, 372. Advanced Topics in Geology.** To meet the individual needs of graduate students for independent study in various environmental sedimentary fields. Variable credit. *Staff*

## GEOLOGY COURSES CURRENTLY UNSCHEDULED

201L. Physical Processes in Coastal Environments

202. Beach and Island Geological Processes

204. Advanced Topics in Nearshore Processes

222L. Statistics and Data Analysis in Earth and Ocean Science

## Public Policy Studies

**197. Marine Policy.** Formal study of policy and policy-making concerning the coastal marine environment. History of specific marine-related organizations, legislation, and issues and their effects on local, regional, national, and international arenas. Topics explored through use of theoretical and methodological perspectives, including political science, sociology, and economics. Consent of instructor required. (Given at Beaufort.) C-L: Environment 276 and Marine Sciences. One course or 3 units. *Orbach*

## Zoology

**203L. Marine Ecology.** Factors that influence the distribution, abundance, and diversity of marine organisms. Course structure integrates lectures, field excursions, and independent research projects. Topics include characteristics of marine habitats,

adaptation to environment, species interactions, biogeography, larval recruitment, rocky shores, marine mammals, fouling communities, tidal flats, beaches, subtidal communities, and coral reefs. (Given at Beaufort.) Prerequisite: none; suggested—introductory ecology, invertebrate zoology, or marine botany. C-L: Environment 219L and Marine Sciences. 4 units. *Staff*

**264S. Advanced Topics in Marine Ecology.** Theoretical concepts from population, community, and evolutionary ecology will be linked to observations and experiments to enhance understanding of the structure and function of marine systems. Current topics in marine ecology (for example, marine food web dynamics, species interactions, life history strategies, fisheries ecology, conservation biology). Discussions will be based on readings from primary literature with emphasis on developing critical and synthetic skills. Each student will prepare a research proposal in NSF format. May be repeated. (Given at Beaufort.) C-L: Environment 269S and Marine Sciences. 2 units. *Crowder*

**295S, 296S. Seminar.** Topics, instructors, and course credits announced each semester. Variable credit. *Staff*

**353, 354. Research.** To be carried on under the direction of the appropriate staff members. Hours and credit to be arranged. C-L: Marine Sciences. Variable credit. *Staff*

**360, 361. Tutorials.** An approved academic exercise, such as writing an essay or learning a research skill, carried out under the direction of the appropriate staff members. Hours and credit to be arranged. Variable credit. *Staff*

## ZOOLOGY COURSES CURRENTLY UNSCHEDULED

**213L. Behavioral Ecology**

**274L. Biology of Marine Invertebrates**



**Duke University Nicholas School of the Environment**  
**MARINE LABORATORY**  
**APPLICATION FOR ENROLLMENT IN SUMMER PROGRAM**

Please fill out completely; type or print.

Date \_\_\_\_\_

Mr., Ms. \_\_\_\_\_

Last Name

First

Middle

Date of birth: (Month) \_\_\_\_\_ (Day) \_\_\_\_\_ (Year) \_\_\_\_\_

Social Security number: \_\_\_\_\_

Current full mailing address:

Street or P.O. Box \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone number (including area code) \_\_\_\_\_

Electronic mailing address: \_\_\_\_\_

Permanent or home full mailing address:

Street or P.O. Box \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone number (including area code) \_\_\_\_\_

Name and full mailing address of parents or guardian:

Name \_\_\_\_\_ Relationship \_\_\_\_\_

Street or P.O. Box \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone number (including area code) \_\_\_\_\_

**DUKE STUDENTS:**

Undergraduate: Trinity \_\_\_\_\_ Engineering \_\_\_\_\_ Other (specify) \_\_\_\_\_

Graduate: Graduate Sch. Arts & Sci. \_\_\_\_\_ School of the Environment \_\_\_\_\_

Other (please specify) \_\_\_\_\_

Class (e.g., junior, 1st yr. M.S.) at time of enrollment at Marine Laboratory (specify rising level): \_\_\_\_\_

Expected date of graduation \_\_\_\_\_

Major \_\_\_\_\_

**NONDUKE STUDENTS (attending summer session only)**

Unclassified: Prebaccalaureate \_\_\_\_\_ Class (e.g., junior) \_\_\_\_\_

Postbaccalaureate \_\_\_\_\_ Class (e.g., 1st yr. M.S.) \_\_\_\_\_

Major \_\_\_\_\_

Expected date of graduation \_\_\_\_\_

If currently attending, list name and address of school \_\_\_\_\_

Have you previously attended Duke: No \_\_\_\_\_ Yes (Give dates): \_\_\_\_\_

Have you received a degree from Duke: No \_\_\_\_\_ Yes (Give dates): \_\_\_\_\_



**ALL STUDENTS** (Applying to courses numbered 100 or higher):

List courses currently in progress (which would not yet appear on a transcript):

List other colleges and/or universities attended and degree(s) received:

**EACH APPLICANT IS REQUIRED TO COMPLETE AND SUBMIT THIS APPLICATION FORM AND TRANSCRIPT(S) OF ACADEMIC WORK COMPLETED TO DATE TO THE ADMISSIONS OFFICE.**

**FIRST TERM:** A maximum of one 6 graduate unit or 1½ course program (6 semester hours) will be permitted 1st term (unless appropriate approval is obtained).

Course Number

Course Title

1st Choice:

Alternate:

**SECOND TERM:** Students are encouraged (but not required) to take ENV 209 Conservation Biology and Policy plus one additional course.

Course Number

Course Title

ENV 209+ 1st Choice:

ENV 209+ Alternate:

One class only. 1st Choice:

Alternate:

**SUMMER TUITION SCHOLARSHIPS ARE AVAILABLE ON A COMPETITIVE BASIS.** In addition to this completed application and current academic transcript(s), scholarship applicants must submit a letter of recommendation from academic faculty and a brief statement of purpose, i.e., the reason for taking the particular course. Preconditions for review of a scholarship application are admission to a specific summer course and submission of the \$150 course deposit. **All supporting scholarship credentials must be received by the Admissions Office of the Marine Laboratory no later than March 1.** For additional information, see the section on Financial Assistance in this publication.

**Please complete below:**

Please consider me for a summer tuition scholarship: Yes  No

Mail Application to: **Admissions Office, Duke University Nicholas School of the Environment,  
Marine Laboratory, 135 Duke Marine Lab Road, Beaufort, North Carolina 28516-9721**

**Duke University Nicholas School of the Environment**  
**MARINE LABORATORY**  
**APPLICATION FOR ENROLLMENT IN SEMESTER PROGRAMS**

Please specify

Please fill out completely; type or print.

Spring Semester (Beaufort to Bermuda) \_\_\_\_\_  
year

Spring Semester (Beaufort entire term) \_\_\_\_\_  
year

Fall Semester \_\_\_\_\_  
year

Date \_\_\_\_\_

1. Mr., Ms. \_\_\_\_\_  
Last Name First Middle

2. Social Security number: \_\_\_\_\_

3. Date of birth: (Month) \_\_\_\_\_ (Day) \_\_\_\_\_ (Year) \_\_\_\_\_

4. A. Current full mailing address:

Street or P.O. Box \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone number (including area code) \_\_\_\_\_

Electronic mailing address: \_\_\_\_\_

4. B. Permanent or home full mailing address:

Street or P.O. Box \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone number (including area code) \_\_\_\_\_

Electronic mailing address: \_\_\_\_\_

5. Name and full mailing address of parents or guardian:

Name \_\_\_\_\_ Relationship \_\_\_\_\_

Street or P.O. Box \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone number (including area code) \_\_\_\_\_

6. DUKE STUDENTS (only)

A. Trinity \_\_\_\_\_ Engineering \_\_\_\_\_ Other (specify) \_\_\_\_\_

B. Major \_\_\_\_\_

C. Class (e.g., junior, senior) at time of enrollment at Marine Laboratory (specify rising level) \_\_\_\_\_

D. Date of matriculation: Month \_\_\_\_\_ Year \_\_\_\_\_

Date of expected graduation: Month \_\_\_\_\_ Year \_\_\_\_\_

A7. **NONDUKE STUDENTS** (Students from institutions other than Duke who are attending for the semester only and who will be classified as special, nondegree students)

A. Name and address of home institution: \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

B. Major \_\_\_\_\_

C. Class (e.g., junior, senior) at time of enrollment at Marine Laboratory (specify rising level): \_\_\_\_\_

D. Date of matriculation : Month \_\_\_\_\_ Year \_\_\_\_\_  
Expected date of graduation: Month \_\_\_\_\_ Year \_\_\_\_\_

E. The following person has been requested to mail a letter of recommendation to the Admissions Office of the  
Duke University Nicholas School of the Environment, Marine Laboratory:  
Name \_\_\_\_\_ Position \_\_\_\_\_  
Institution \_\_\_\_\_

F. Transcript(s) will be sent by the following institution(s):  
\_\_\_\_\_  
\_\_\_\_\_

G. List courses currently in progress (which would not yet appear on a transcript):  
\_\_\_\_\_  
\_\_\_\_\_

H. Have you ever been placed on probation or suspended or dismissed from any school?  
No \_\_\_\_\_ Yes \_\_\_\_\_ (If yes, please explain below.)

I. Have you previously attended Duke: No \_\_\_\_\_ Yes (Give dates): \_\_\_\_\_  
Have you received a degree from Duke: No \_\_\_\_\_ Yes (Give dates): \_\_\_\_\_

**Mail Application to:**  
**Admissions Office**  
**Duke University Nicholas School of the Environment**  
**Marine Laboratory**  
**135 Duke Marine Lab Road**  
**Beaufort, North Carolina 28516-9721**









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*bulletin of*  
**Duke University**  
**1998-99**

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*School of Law*





## **The Mission of Duke University**

The founding Indenture of Duke University directed the members of the university to "develop our resources, increase our wisdom, and promote human happiness."

To these ends, the mission of Duke University is to provide a superior liberal education to undergraduate students, attending not only to their intellectual growth but also to their development as adults committed to high ethical standards and full participation as leaders in their communities; to prepare future members of the learned professions for lives of skilled and ethical service by providing excellent graduate and professional education; to advance the frontiers of knowledge and contribute boldly to the international community of scholarship; to foster health and well-being through medical research and patient care; and to promote a sincere spirit of tolerance, a sense of the obligations and rewards of citizenship, and a commitment to learning, freedom, and truth.

By pursuing these objectives with vision and integrity, Duke University seeks to engage the mind, elevate the spirit, and stimulate the best effort of all who are associated with the university; to contribute in diverse ways to the local community, the state, the nation, and the world; and to attain and maintain a place of real leadership in all that we do.

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*School of Law*

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The information in this bulletin applies to the academic year 1998-99 and is accurate and current, to the extent possible, as of June 1998. The university reserves the right to change programs of study, academic requirements, teaching staff, the calendar, and other matters described herein without prior notice, in accordance with established procedures.

Duke University does not discriminate on the basis of race, color, national origin, handicap, sexual orientation or preference, gender, or age in the administration of educational policies, admission policies, financial aid, employment, or any other university program or activity. It admits qualified students to all the rights, privileges, programs, and activities generally accorded or made available to students. For further information, contact the equal opportunity officer (919-684-4736).

Information that the university is required to make available under the Student Right to Know and Campus Security Acts may be obtained from the Office of University Relations at 684-2823 or in writing to 615 Chapel Drive, Box 90563, Duke University, Durham, North Carolina 27708.

Duke University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404-679-4501) to award baccalaureates, masters, doctorates, and professional degrees.

Inquiries about the Law School may be made by calling (919) 613-7006. Queries about admissions, financial aid or other aspects of the Law School's programs, may also be sent via the Internet to [ADMISSIONS@LAW.DUKE.EDU](mailto:ADMISSIONS@LAW.DUKE.EDU). Please also see the Law School's World Wide Web Site at [HTTP://WWW.LAW.DUKE.EDU](http://WWW.LAW.DUKE.EDU).

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# Calendar of the School of Law 1998-99

## Summer Term-1998

|        |                    |
|--------|--------------------|
| June   |                    |
| 8      | Orientation        |
| 9      | First day of class |
| August |                    |
| 7      | Last day of class  |
| 11     | Examinations       |
| 14     | Examinations       |

## Summer Program in Geneva and Hong Kong-1998

|        |                                   |
|--------|-----------------------------------|
| July   |                                   |
| 5      | Orientation                       |
| 6      | First session classes begin       |
| 17     | Last day of class—first session   |
| 20     | First day of class—second session |
| 31     | Last day of class—second session  |
| August |                                   |
| 2-4    | Examinations                      |

## Fall Term-1998

|           |   |
|-----------|---|
| August    |   |
| 20—21     | Orientation for entering students   |
| 23        | Law School Convocation, 5:00 pm   |
| 24        | First day of classes for all courses  |
| September |   |
| 9-13      | The Duke University Private Adjudication Center will offer Mediation Certification Training at the R. David Thomas Center |
| October   |   |
| 19-23     | No classes—off-campus interviews and first year writing   |
| November  |   |
| 26-27     | Thanksgiving recess   |
| December  |   |
| 7         | Thursday classes meet   |
| 8         | Last day of class for all courses   |
| 9-18      | Reading and examination period for first-year courses   |
| 9-19      | Reading and examination period for upperclass courses   |

## Spring Term-1999

|           |   |
|-----------|---|
| January   |   |
| 11        | First day of class for all regular courses            |
| 14-17     | Intensive Trial Practice weekend                      |
| 18        | Martin Luther King, Jr. Holiday—no classes            |
| March     |   |
| 15-19     | Spring break  |
| April     |   |
| 2         | Last day of classes for all courses                   |
| 25-May 12 | Reading and examination period for upperclass courses |
| 25-May 13 | Reading and examination period for first-year courses |
| May       |   |
| 15        | Law School Hooding Ceremony                           |
| 16        | University Commencement                               |

[The current Law School calendar is also available at the Law School's World Wide Web site at <http://www.law.duke.edu>.]

# University Administration

## GENERAL ADMINISTRATION

Nannerl Overholser Keohane, Ph.D., *President*

John W. Strohhahn, Ph.D., *Provost*

Ralph Snyderman, M.D., *Chancellor for Health Affairs and Dean, School of Medicine*

Tallman Trask III, Ph.D., *Executive Vice-President*

Eugene J. McDonald, LL.M., *Executive Vice-President Asset Management*

John F. Burness, A.B., *Senior Vice-President for Public Affairs*

John J. Piva, Jr., B.A., *Senior Vice-President for Alumni Affairs and Development*

Charles E. Putman, M.D., *Senior Vice-President, Research Administration and Policy*

Myrna C. Adams, B.A., M.Ed., J.D., *Vice-President for Institutional Equity*

John F. Adcock, B.S., *Vice-President and Corporate Controller*

Janet Smith Dickerson, M.Ed., *Vice-President for Student Affairs*

Joseph S. Beyel, M.S., *Vice-Chancellor for Medical Center Development and Alumni Affairs*

William J. Donelan, B.A., M.S., *Vice-Chancellor and Chief Financial Officer for Medical Center Administration*

Gordon G. Hammes, Ph.D., *Vice-Chancellor for Medical Center Academic Affairs*

Michael Israel, A.B., M.P.H., *Vice-Chancellor for Health Affairs, Chief Executive Officer, Duke University Hospital*

Jean Gaillard Spaulding, M.D., *Vice-Chancellor for Health Affairs*

Alvis R. Swinney, B.S., M.P.H., *Vice-Chancellor for Medical Center Business Development and Marketing*

David B. Adcock, J.D., *University Counsel*

N. Allison Haltom, A.B., *Secretary of the University*

William H. Willimon, M.Div., S.T.D., *Dean of the Chapel*

Joseph L. Alleva, M.B.A., *Director of Athletics*

## Law School Administration, 1998-99

Pamela B. Gann, *Dean*

Thomas B. Metzloff, *Senior Associate Dean, Academic Affairs*

Richard A. Danner, *Associate Dean, Library and Computing Services*

Judith A. Horowitz, *Associate Dean, International Studies*

Theresa A. Newman, *Associate Dean, Academic Affairs*

Dennis Shields, *Assistant Dean, Admissions and Financial Aid*

Robert E. Smith, *Assistant Dean, Career Services*

Susan L. Sockwell, *Associate Dean, Student Affairs*

E. Carol Spruill, *Assistant Dean, Academic Affairs*

Linda G. Steckley, *Associate Dean, External Affairs*





Altruism combined with realism; knowledge of fundamental principles and capacity to apply them; courage to insist on the right and patience to achieve it; understanding of the timidity of the weak; fearlessness of the domination of the powerful; sympathy for the mistakes of the indiscreet; caution of the craftiness of the unprincipled; enthusiasm for that which is fine and inspiring; reverence for that which is sacred; these are some of the attributes of great lawyers.

Justin Miller  
Dean, 1930-34  
Duke University School of Law



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*The Distinction of Duke*



## Duke University

The Law School is an integral part of one of the nation's foremost research universities. Duke's origins were in Randolph County where, in 1838, the Methodist and Quaker communities formed Union Institute to educate their children. The school was chartered by the state in 1851 as Normal College and granted the authority to grant degrees in 1853. In 1859 its mission was expanded to educate ministers and its name changed to Trinity College, which relocated to Durham in 1892. In 1924, a grant from James Buchanan Duke made possible its transformation into Duke University, with the advice by Mr. Duke that "courses at this institution be arranged, first, with special reference to the training of preachers, teachers, lawyers and physicians, because these are most in the public eye, and by precept and example can do most to uplift mankind."

Although Duke is young by comparison to other major American universities, its undergraduate programs and its graduate and professional schools together have attained an international stature and a reputation for quality and innovation that few universities can match. Among Duke's unique strengths are an extensive network of interdisciplinary collaboration, an emphasis in teaching and research initiatives addressing global and international issues, and a commitment to growth in environmental studies and the basic sciences.

Duke has one of the most spacious and lovely campuses of any major university. The beautiful neo-Gothic buildings on West Campus, stately Georgian-style architecture on East Campus, and stunning contemporary design of its newest centers and schools (including an addition to the law building itself) are situated in and around 7,700 acres of undeveloped forest and 30 miles of jogging trails. Geographically, Duke is located near the cultural and research resources of three other major universities and to the fast-growing high-technology business and research center of the Research Triangle Park. It is also accessible to the natural beauty of the Blue Ridge Mountains to the west and the state's many beaches to the east. The climate is mild, with spring beginning as early as February and fall reaching well into November. Plays, concerts, lectures, and athletic events are plentiful in a setting free of many of the day-to-day aggravations and distractions of larger metropolitan centers. For these reasons and others, survey after survey singles out the Triangle area in which Duke is located for its high quality of life.

Current information on Duke University programs and events is available through the Law School's World Wide Web site: <http://www.law.duke.edu>.

## The Law School's Mission

The Law School was established as a graduate professional school in 1930. Its mission is to prepare students for responsible and productive lives in the legal profession. As a community of scholars, the Law School also provides leadership at a national and international level in efforts to improve the law and legal institutions through teaching, research, and other forms of public service.

Because the Law School's mission focuses on students' broader preparation for a life in the law, students should not come to the school expecting primarily to amass information about the specific laws of particular jurisdictions. In fact, only a small part of the preparation required for participation in the legal profession entails the transmission of legal rules, which are countless and subject to frequent change and reinterpretation. The best lawyers are those who have internalized the processes of legal reasoning, which require creativity as well as intellectual discipline and critical analysis, and who have acquired the capacity for legal judgment that can be adapted and applied to new fields and to the circumstances of an ever-changing world. At Duke Law School the faculty focuses on helping students develop the adaptive skills and broader perspectives required of lawyers across the spectrum of legal practices.

## Learning Environment

Duke law students come from all parts of the United States and, in already significant and growing numbers, from other parts of the world. Although about a tenth are graduates of Duke's Trinity College, most Duke law students have few prior contacts with the area. Most live in the apartments, townhouses, and renovated older homes within a few minutes of the school. Because of these circumstances, Duke law students are more likely than others to find their social circles merging with their academic ones.

Admission to Duke Law School is highly competitive. Only a handful of law schools admit an entering class with a higher median Law School Admission Test (LSAT) score, and most students graduated at or near the top of their undergraduate classes. Many students have earned advanced degrees in other fields and many have achieved distinction in non-academic pursuits as well, such as athletics, business, or community service. As one should expect from such a group, they are competitive and hard working. The Law Library receives intensive use by students throughout most weekends and a few students can be found there into the small hours of most nights.

At the same time, Duke Law School has a deserved reputation for maintaining a friendly and helpful environment for students, with a less competitive atmosphere than is found at other top law schools. Several factors make this possible. First, Duke is smaller than most of its rivals. The school aims at an entering class of about 200. Several schools with which Duke competes are twice that size, and some are three times as large. While size may offer some advantages, it also depersonalizes relationships among students and between faculty and students.

Second, the Duke law faculty is more accessible than most. In part, this accessibility reflects a curricular design that brings all first-year students into close contact with a member of the regular faculty through a small section of about 24 students in one course in their first semester. These small sections offer students the opportunity to get to know at least one professor well and to support each other in their introduction to the law school experience. Many students continue in upperclass years to find their close friends and study partners among those who were in their first-year small sections.

Law faculty accessibility is also a mark of the ethic of our faculty, who view their profession as teaching and scholarship, not the practice of law. Duke faculty are excellent, dedicated teachers. In addition, professors tend to be in their offices on most days throughout the calendar year and have either regular office hours or very flexible



“open-door” policies.

Another factor contributing to the somewhat less competitive atmosphere at Duke is the fact that Duke law graduates disperse more broadly upon graduation than do those of most law schools, to about 30 to 35 states. As a result, few Duke students are in direct competition for the same first job, except possibly for the most highly competitive judicial clerkships. In addition, placement rates of Duke law students are very high. Of the most recent graduating classes, 93 percent of students had jobs by the date of graduation and over 98 percent were employed within six months. Over 20 percent of students typically begin their careers in judicial clerkships.

Despite the school's small size, upperclass students have an unusually large number of opportunities to participate in significant shared professional activities. The Law School publishes six journals, including the *Duke Law Journal*, *Law and Contemporary Problems*, the *Alaska Law Review*, the *Duke Journal of Comparative and International Law*, the *Duke Environmental Law and Policy Forum*, and the *Duke Journal of Gender Law and Policy*, giving Duke law students unusually extensive opportunities for scholarly writing and editing activities. Besides journal participation, students have many opportunities to engage in professionally related activities. The Pro Bono Office at the Law School annually places over 200 students in activities in the public, private, and nonprofit sectors. Some represent abused children as guardians ad litem; some prosecute cases in a district attorney's office; others represent prisoners, advise victims of domestic violence, or prepare wills for AIDS patients. There are also over two dozen student organizations and special interest groups at the Law School, which are described in greater detail under the heading “Beyond the Curriculum” in this bulletin.

For all these reasons, the environment of the Law School is distinctive. Duke law students compete vigorously but as friends and colleagues. While alienation and hostility are traits that may be found at Duke from time to time, they do seem less common and less intense than at most major national law schools.

## Professionalization

In recent years, there has been growing concern in the legal profession and the public more generally about the adequacy of professional training of lawyers. Complaints have focused on (1) the inadequacy of legal skills, especially writing, negotiation and mediation, and oral persuasion, (2) the decline in ethical standards, and (3) the failure of legal education to keep pace with the changing demands of law practice, which is more international and which requires greater knowledge of business, administrative agencies, and technology than in the past. Duke Law School is addressing these concerns in a variety of ways and on several levels.

**Legal Research and Writing and Lawyering Skills Programs.** Duke's year-long legal research and writing program for first-year law students is unsurpassed among the top law schools in this country. At many schools, these courses are taught by upperclass law students, recent law graduates, or practitioners who serve as adjunct instructors. At Duke, the research and writing course is taught by persons with substantial past law practice experience who have moved into the teaching of legal writing as their primary professional commitment.

Duke's approach to teaching writing is relatively new to legal education. It combines an emphasis on the integration of legal analysis, writing, and research with a focus on how readers read a document and what techniques used by the writer will help readers understand the writer's intentions. In their substantive courses, the students learn how to be creative in constructing a variety of interpretations of a given piece of prose; in the writing course, they learn how best to limit the number of interpretations of their prose that others can make.



Writing assignments range from short case briefs to motion documents and appellate briefs. The students classroom experience is supplemented by individual conferences with instructors and large group lectures on reader expectation principles. Legal research skills are taught by members of the Law School's excellent library staff and are fully integrated with the legal writing instruction.

In the upperclass curriculum, Duke has developed a distinctive clinical program that emphasizes clinical training primarily through simulation. This program covers a wide variety of fields of legal study. Over half of Duke's law students take courses in negotiation and mediation and in trial practice. Practical, hands-on clinical training is also provided in such courses as appellate practice, collective bargaining, death penalty litigation, entertainment law, estate planning, federal civil rights, international arbitration, professional malpractice, and professional responsibility. Some of these courses are taught by members of the regular faculty and some are taught by outstanding practitioners, several of whom come to us on an adjunct basis from leading law practices in Washington D.C. and New York City. A limited number of upperclass students enroll in a criminal practice clinic and participate in criminal litigation with local attorneys, and recently established clinics enable students to work under faculty supervision on the legal needs of AIDS patients and on representation of defendants in capital cases. Many students enroll in an appellate practice course, in which they receive one-on-one feedback on a written brief and oral argument from a distinguished appellate judge. Finally, law students benefit from the presence at Duke of the Private Adjudication Center (PAC). This center is a non-profit corporation that undertakes research and education and provides alternative dispute resolution services to clients wishing to avoid the delays and costs of traditional litigation; most recently it has undertaken the processing of claims from the Dalkon Shield litigation. The PAC offers opportunities for some students to obtain direct practical experience in alternative dispute resolution as well as participation in developing innovations in this important field.

**Program in Ethics and the Legal Profession.** In response to widespread concern about ethical standards in the legal profession and changes in the structure of the practice of law, Duke is in the process of revising its curriculum in ethics and professional responsibility. With the support of the Keck Foundation, from 1993-97 Duke offered both an intensive one-week course in legal ethics in January for first-year students and an array of upperclass electives focused on ethical issues in specific areas of practice which students might choose to enter. These upperclass courses addressed ethical issues in representing corporations, the government, those needing estate planning and family law representation, and parties in civil and criminal litigation; courses have also been offered in the history of the legal profession, judicial ethics, and professional malpractice. Following its review of the experience under the Keck grant, in the spring of 1997 the Duke faculty committed itself to adding a required upperclass course in ethics and professionalism beginning in 1998-99, and to reevaluating and redesigning the first-year introduction to ethics. The Program in Ethics and the Legal Profession evidences the faculty's commitment to transmitting the highest standards in professional responsibility.

**The International Dimension.** No law school can ignore the impact on the legal profession of the current globalization of world markets, the growth in economic regional integration, such as the European Union and the North American Free Trade Agreement, and the growing interdependence of individual countries facing common threats to the environment, international security, and political stability. The Law School at Duke has helped to lead the efforts of the wider university community to respond to these important developments.



The Law School's innovative approach to preparing its students for law practice in an increasingly international economic and political scene was evident when it became the first law school in the United States to offer American students the special opportunity to begin their legal studies in the summer, to pursue a formal J.D./LL.M. joint-degree program in international and comparative law. This program attracts to Duke many students with a special interest in these fields, with close to one out of seven members of each entering class enrolled as joint J.D./LL.M. students. Students in this program devote a substantial part of their first year to the study of foreign and international law, thus materially broadening their perspective on the standard first-year law material. These same students go on to study in the Law School's four-week residential summer programs in Geneva or Hong Kong. The annual Institute in

Transnational Law in Geneva, sponsored by Duke and the University of Geneva Faculty of Law, involves over 50 participants, about one-third of whom are from Duke with the remainder from more than 15 countries throughout the world. The faculty comes from Duke Law School and from several foreign and other American universities. This program provides its participants an opportunity to meet representatives of such Geneva-based international bodies as the World Intellectual Property Organization and various private international law firms. The program in Hong Kong, the Asia-America Institute in Transnational Law, has been developed in conjunction with the University of Hong Kong Faculty of Law along the same model as the Geneva program. It offers an alternative setting for joint-degree students with special interests in Asia and the Pacific Rim. No other law school offers summer international programs of better scope, quality, faculty, and student participation.

The Law School's excellence and growing presence in comparative and international law are made possible by a superb core faculty. Some faculty members are from foreign countries and many others are leading experts in various fields with international and comparative dimensions, including comparative law, international business transactions, and public international law. New members of the faculty recently have been added in the fields of privatization, international trade, and international environmental law. Duke law faculty have taught or lectured to international audiences in as many as 40 countries in recent years.

Because of the Law School's strengths in the international law area, the school has attracted foreign faculty visitors from many countries. Regular ties have now been established with professors who are recurring visitors from Brussels, Tokyo and Beijing. In addition, recent years have brought visitors from Aarhus, Alberta, Cape Town, Caracas, Copenhagen, Exeter, Geneva, Hamburg, Jerusalem, Kiev, Kyoto, Melbourne, Munich, Munster, New Delhi, Oxford, Osaka, Paris, Pusan, Seoul, Shanghai, Shenzhen, Sydney, Taipei, and Tokyo. With such visits often comes the enrichment of the curriculum by specialized course offerings in the international and comparative law fields.

In addition to this influx of international faculty, Duke also has an international student population that is usually about 10 percent of the student body. Besides international students admitted to the regular J.D. program, about 50 lawyers are admitted each year to the program leading to the LL.M. (Master of Laws) degree. They come from countries as disparate as Argentina, Belarus, Chile, the People's Republic of China, Denmark, England, Germany, Iceland, Indonesia, Japan, Kazakhstan, Korea, Malaysia, Mexico, Panama, Poland, Saudi Arabia, South Africa, Taiwan, Tanzania, and Thailand. A few LL.M. graduates remain for a doctorate. Duke is unusual in the degree to which these students are integrated into the community of American students. Most LL.M. candidates take one course from the first-year curriculum, often in one of the small sections where social and professional interaction is most likely to occur. Most of their other courses are taken with American students as well. LL.M. students also serve as staff members of the Duke Journal of Comparative and International Law and are represented on the Duke Bar Association Executive Committee.

**Interdisciplinary Studies.** The Law School has a strong commitment to unifying its students' professional learning with the broadest dimensions of knowledge about human affairs and institutions. It recognizes the unfortunate impulse of some law students to exclude from their vision all learning save that for which they see immediate career impact and appreciates the fact that the best lawyers are ones who have had their minds opened to the wider implications and consequences of law. This recognition is supported strongly by the larger university's commitment to interdisciplinary studies. The Law School not only offers a rich curriculum that incorporates perspectives in economics, philosophy, literature, history, and technology, but also a range of joint-degree program with several Graduate School



departments and professional schools that is at least as extensive as that of any other national law school. Through these programs, students can pursue two degrees simultaneously and, via overlapping credit arrangements, in less time than both degrees together would ordinarily take. These joint-degree programs attract students interested in preserving as professionals a life of the mind, and in attaining a broader view of the discipline of law that may over the longer term enhance their professional judgment.

Over 25 percent of Duke law students pursue a degree at Duke in addition to the J.D. Students pursuing an M.A. or M.S. degree participate with the joint J.D./LL.M. students in Duke's unique summer-entering program, through which students can begin their studies in June and complete two of the six major first-year courses by mid-August. These joint J.D./M.A. or J.D./M.S. students are then free to enrich their first-year Law School experience with courses in their other chosen field. For those seeking the J.D. and M.A. degrees in English, history, philosophy, romance studies, humanities, economics, cultural anthropology, political science, psychology, environmental studies, or public policy studies, or an M.S. degree in mechanical engineering, work toward both degrees can be completed within the remaining two academic years, with a slight overload during some semesters.

Students pursuing joint professional degrees in the Divinity School, the Fuqua School of Business, the Nicholas School of the Environment, or the Sanford Institute of Public Policy begin their studies in the fall with the rest of the first-year class and obtain in four years both their J.D. degree and an M.T.S. (theological studies), an M.B.A. (business), an M.E.M. (environment), or a M.P.P. (public policy). A few others pursue a longer joint J.D./M.D. program in law and medicine, or a J.D./Ph.D. program in political science. Students in these programs often begin their studies with career goals that require professional immersion in the two different professions. While the two degrees are not a guarantee of better job opportunities, law alumni in practice report the desirability of more exposure by students to other fields, and have spoken especially highly of the value to lawyers of training in business. Other joint-degree programs are sometimes arranged on an individualized, ad hoc basis. Greater detail about these programs is set forth in "Degree Programs" in this bulletin.

The tremendous success of the joint-degree programs at Duke is due, in part, to the extensive links between the faculty and other disciplines. The Duke law faculty has proportionately more joint appointments than any law faculty, and many professors from other departments and schools at Duke and from the University of North Carolina at Chapel Hill, North Carolina Central University, and North Carolina State University hold adjunct appointments in the Law School. Disciplines represented by these secondary appointments include business, English, history, philosophy, political science, psychiatry, psychology, public policy, and religion. The group includes several senior persons of extraordinary attainment and national visibility whose presence enriches the intellectual climate of the Law School. The joint professional degree programs are also facilitated by the physical proximity of the professional schools. The Fuqua School of Business and the Sanford Institute of Public Policy are both next-door neighbors, and the Nicholas School of the Environment is within a short walk of the Law School.

**Library and Academic Computing.** The Duke Law Library is among the very best in the country. Its book collection of over 500,000 volumes is extraordinary, especially for a law school of Duke's size. Even more important in this new age of academic computing, the level of its electronic information sources, its computing services, and the professionalism of its staff are virtually unparalleled.

Recent computer and network upgrades enable students and lawyers to engage in the most sophisticated and comprehensive legal research available. A recently completed physical expansion of the law library has increased its size by 50 percent,



greatly enlarging the study space and the number of computer workstations with network access available to students. The pervasive importance of computers to modern law study is reflected in the requirement (with appropriate financial aid allowances) that entering J.D. candidates own or buy a computer capable of accessing the student network. Through the law library, access may be had to resources in other libraries at Duke and, through interlibrary loan requests, from other universities. Finally, the library staff is well-trained, easily accessible, and extremely helpful to students. Visitors from other law schools and institutions often note the extraordinary quality of the library services available from Duke's law library staff.

## The Faculty

The Duke Law School faculty is unquestionably its greatest asset. About the same size as the law faculties at Chicago and Cornell, it is as wide-ranging and distinguished as any of its competitors. Duke law professors have been Rhodes, Marshall, and Fulbright Scholars, editors-in-chief of law journals, and clerks to federal appellate judges and Supreme Court justices. They bring to their teaching not only a love of teaching but significant practical experience in both public and private sectors as partners in prestigious law firms, legal services lawyers, public defenders, and government attorneys. Gradual increases in total faculty size have enriched the core faculty while improving the student-faculty ratio.

Because of its excellent faculty in the corporate law fields, Duke is particularly successful in attracting students with career interests in this area. It also has some of the finest faculty of any national law school in constitutional law and constitutional history; administrative law and regulation, including regulation of the environment and the health industry; sports law; legal theory including feminist and critical race theory; and the process-related fields of criminal and civil procedure, litigation, and alternative dispute resolution. Its interdisciplinary faculty is extraordinary and includes world-class scholars in critical literary theory, moral philosophy, ethics, and history. A growing body of faculty in international and comparative law has given Duke prominence in these important fields as well.

Members of the current law faculty publish widely and with great distinction. Some have published award-winning books and treatises; Professor Donald Horowitz, for example, recently won the Ralph J. Bunche Prize of the American Political Science Association for his book on electoral reform in South Africa. Many faculty members have published articles in the best national law journals that are among the most cited works in their fields. Over half of the faculty have published textbooks in their areas of interest, including texts that lead their fields in environmental law, securities regulation, sports law, fiduciary obligations, First Amendment, gender and law, and federal criminal law. Members of the faculty also lecture widely, at other law schools, at national association meetings and conferences, and in international settings as diverse as Cape Town, Moscow, Budapest, Tokyo, London, Kuala Lumpur, Ottawa, Warsaw, Taipei, and Helsinki. In recognition of their distinguished scholarship, members of the faculty have received prestigious fellowships from such organizations as the Guggenheim Foundation, the Rockefeller Foundation, the Carnegie Foundation, the Council on Foreign Relations, and the National Humanities Center, and have been invited to membership in such organizations as the American Academy of Arts and Sciences and the National Academy of Science. They also serve on editorial boards of such journals as the *American Journal of Comparative Law*, the *Journal of British Studies*, the *Journal of Democracy*, *Law and History Review*, *Law & Philosophy*, *Law Library Journal*, *Law and Contemporary Problems*, and *Psychology, Crime and Law*.

The Law School faculty is actively engaged in local, national, and international efforts to improve law and legal institutions and to effect changes in society. Scholars

in professional schools, more so than their colleagues in the arts and sciences, have access to persons in government, the judiciary, business, and religious and other important institutions in our society. This access provides them an opportunity to seek to apply their knowledge and research toward influencing legal change. The Duke Law School faculty is as active as any in the United States in the influence it exerts and the commitment it displays to public service. Several faculty members give testimony to and consult regularly with government agencies and departments on such topics as health care reform, reform of the Federal Rules of Civil Procedure, national security issues, national service, and the nomination of federal judges and Supreme Court justices. Many are involved in work with the American Law Institute, on Restatements of the Law or projects in various fields including the law governing lawyers, torts, and complex litigation; one faculty member currently serves as co-reporter for the ALI's Principles of the Law of Family Dissolution, and another faculty member for a new Restatement of Agency and Fiduciary Obligation. Several members of the faculty are active in various consulting groups with the American Bar Association, including the ABA's Working Group on Lawyers' Representation of Regulated Clients, and the Central and Eastern European Law Initiative. Some have participated on the North Carolina General Statutes Commission or been involved in other ways in state and local law reform projects. Other faculty members advise private and public clients on issues of constitutional law, intellectual property, international human rights, environmental policy, sex and race discrimination, and sports law.

Complementing the strengths of the regular faculty are the members of the extended faculty network on which the Law School draws to enrich its curriculum. This extended faculty includes the joint-appointment faculty discussed above under Interdisciplinary Studies; adjunct faculty members who add critical expertise and experience in specific practice areas, especially trial practice and alternative dispute resolution, banking, estate planning, and securities practice; distinguished judges who help teach courses in professional responsibility, legal ethics, and appellate practice; and international visitors who regularly teach courses in the international and comparative law fields. This network of ties makes Duke as thoroughly integrated in its intellectual life as any American law school.

The collective presence of these secondary faculties manifests the self-confidence of an institution reaching out to the legal profession, to other academic communities, and to the international legal world for the best that these constituencies have to offer to those engaged in the study and illumination of law. Together with the supportive student environment and a talented and dedicated regular faculty willing to innovate and respond to the changing needs of law practice, they provide a truly distinctive opportunity for the study of law.

Another important aspect of the law faculty's commitment to its students is the relationship it maintains with its alumni. Duke's law alumni are among the most dispersed of any law alumni body. The Law School uses this fact to its advantage, gaining the help of its alumni to recruit admissions candidates from throughout the country and the world and in providing placement counseling and assistance to its students. To maintain a sense of community and identity with the Law School and among its alumni, the Office of External Relations coordinates and supports the activities of local law alumni associations. Over 40 such associations now exist, including international groups in Europe, Latin America, and Asia. Alumni awareness of the progress and needs of the school is maintained through annual educational and social events attended by Law School representatives. These programs, in addition to regularly scheduled reunions at the Law School and career advising panels conducted by alumni for our students, foster lifelong engagement with the school through the decades despite the distance.

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*Law Faculty*



Presented here are faculty holding academic appointments in the Law School extending beyond one year.

**Katharine Tiffany Bartlett, *Professor of Law***

B.A. 1968, Wheaton College; M.A. 1969, Harvard University; J.D. 1975, University of California, Berkeley. Professor Bartlett, formerly a secondary school teacher, commenced her legal career with a judicial clerkship in the Supreme Court of California. From 1976 to 1979, she worked as a staff attorney at the Legal Aid Society of Alameda County in Oakland, California, where she concentrated on major impact litigation in the areas of disability law and pension law reform. She began teaching at Duke in 1979. She has written extensively on various family law topics, and is coauthor of a family law casebook. She also specializes in gender issues and has written several major articles in that area, as well as a casebook on gender and law and a reader in feminist legal theory. She has held visiting appointments at UCLA and at Boston University. From 1993 to 1995, she served as senior associate dean for academic affairs. In 1994, she was appointed a reporter for the American Law Institute's *Principles of Family Dissolution*.



**Sara Sun Beale, *Professor of Law***

1971, J.D. 1974, University of Michigan. A native of Toledo, Ohio, Professor Beale's experience includes a judicial clerkship on the United States Court of Appeals, as well as a year in private practice in Detroit, Michigan. In 1976 she joined the United States Department of Justice, where she served one year in the Office of Legal Counsel, and two years in the Office of the Solicitor General. She began her teaching career at Duke in 1979, and she has also taught at the University of Michigan. She is the coauthor of *Grand Jury Law and Practice* (1986) and *Federal Criminal Law* (2d ed. 1993). Her principal academic interests are in the field of criminal law and procedure. She served as senior associate dean for academic affairs in 1997-98.





**Herbert L. Bernstein, Professor of Law**

LL.B. 1953, Dr. jur. 1962, Hamburg University, Germany; J.D. 1967, University of Michigan. A native of Germany, Professor Bernstein practiced as a junior lawyer until 1958 and as a regular member of the bar thereafter. Simultaneously, he was a research and teaching assistant at Hamburg University from 1956 to 1960. Since 1958 he has also been affiliated with the Max-Planck Institute of Foreign and Private International Law. He taught at the University of California from 1967 to 1971; then returned to Hamburg University as professor of law. After a previous visit, he came to Duke from Hamburg in 1984. His teaching includes European Union law, contracts, conflict of laws, comparative law, insurance, and international organizations. He is the author of numerous books and articles on diverse subjects in the fields of international law, conflict of laws, insurance, and business law.



**Michael H. Bradley, F.M. Kirby Professor of Investment Banking and Professor of Law**

A.B. 1969, University of Idaho; M.B.A. 1973, Syracuse University; Ph.D. 1979, University of Chicago. Professor Bradley came to Duke from the University of Michigan where he had appointments at the law and business schools. He has also served on the faculties of the Universities of Chicago and Rochester. Professor Bradley's teaching and research interests lie at the intersection of corporate finance and corporate law. He has published papers on corporate capital structure, mergers and acquisitions, takeover defenses and tactics, government regulation of the securities market, insider trading, fiduciary duties of corporate managers, corporate governance and corporate bankruptcy. His work has been cited in textbooks, professional journals, and in the decisions of numerous state and federal courts, including the U.S. Supreme Court.



**H. Keith H. Brodie, James B. Duke Professor of Psychiatry and Professor of Law**

A.B. 1961, Princeton University; M.D. 1965, Columbia University. Dr. Brodie served at hospitals in New Orleans and New York City before becoming a clinical associate with the National Institute of Mental Health in 1968. In 1970, he joined the medical faculty of Stanford University. He was given the William C. Menninger Award by the American College of Physicians in 1994. Dr. Brodie is a member of the Institute of Medicine of the National Academy of Sciences. He came to Duke in 1974 as professor and chairman of the Department of Psychiatry and director of Psychiatric Services at Duke University Medical Center. He has also served as president of the American Psychiatric Association. His book *Modern Clinical Psychiatry*, published in 1982, has been translated into four languages. Recently, Dr. Brodie has served as chair of the Institute of Medicine Committee on Substance Abuse and Mental Health Issues in AIDS Research and co-editor of the committee's report, *AIDS and Behavior: An Integrated Approach*, 1994. He was first appointed to the law faculty in 1982. He served as president of Duke University from 1985 to 1993.



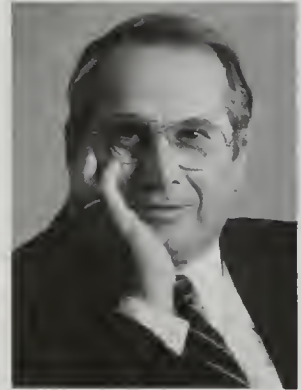
Paul D. Carrington, *Harry R. Chadwick, Sr., Professor of Law*

B.A. 1952, University of Texas; LL.B. 1955, Harvard University. Professor Carrington is a native of Dallas, Texas. His professional experience includes a brief stint in private practice in Dallas and in a military law office, as well as occasional work for the American Civil Liberties Union and the American Association of University Professors. Since his teaching career began in 1957, he has taught in nearly a score of law schools in the U.S. and abroad. He was the dean at Duke from 1978 to 1988. He has been active in judicial law reform efforts, particularly in regard to appellate courts and procedure. He has published in the fields of civil procedure, education law, and legal education. From 1985 to 1992, he served as reporter for the Committee of the Judicial Conference of the United States which advises the Conference and the Supreme Court on changes in the Federal Rules of Civil Procedure. He is chair of the board of the Law School's Private Adjudication Center. He teaches civil procedure and international dispute resolution.



George C. Christie, *James B. Duke Professor of Law*

A.B. 1955, J.D. 1957, Columbia University; S.J.D. 1966, Harvard University. A native of New York City, Professor Christie was editor-in-chief of the *Columbia Law Review*. He commenced his legal career with private practice in Washington, D.C. In 1960-61, he was a Ford Fellow at Harvard Law School; and in 1961-62, he was a Fulbright Scholar at Cambridge University, where he earned a diploma in international law. He then joined the law faculty of the University of Minnesota, where he taught for almost four years. In 1966, he returned to Washington to serve as assistant general counsel for the Near East and South Asia of the Agency for International Development before coming in 1967 to Duke. His chief academic interests are in the areas of torts and jurisprudence, in both of which he has published widely. He is the editor of a casebook in jurisprudence published in 1973, and now in its second edition, and one on torts first published in 1983, and now in its third edition. His monograph, *Law, Norms and Authority*, was published in 1982. He has been a visiting professor at Northwestern University, George Washington University, the Universities of Michigan, Florida, Otago in New Zealand, Witwatersrand in South Africa, and Fudan University in Shanghai, and a fellow of the National Humanities Center. He is a member of the Board of Editors of *Law and Philosophy*.



Amy L. Chua, *Associate Professor of Law*

A.B. 1984, J.D. 1987, Harvard University. Professor Chua was executive editor of the *Harvard Law Review* and after graduation clerked for Judge Patricia Wald of the United States Court of Appeals. From 1988 to 1993 she was an associate for a large New York City law firm, working on securities transactions throughout Asia, Latin America and Europe. Professor Chua's current academic interests relate to the link between markets and ethnicity in developing countries. She teaches in the areas of contracts and international business transactions.



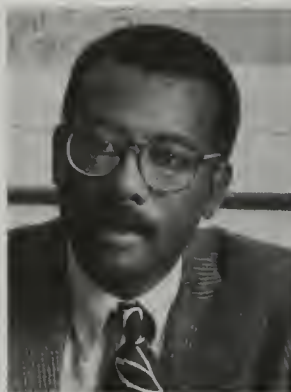
Charles T. Clotfelter, *Z. Smith Reynolds Professor of Public Policy Studies, Professor of Economics, Professor of Law*

A.B. 1969, Duke University; Ph.D. 1974, Harvard University. Professor Clotfelter is a native of Birmingham, Alabama, and was raised in Atlanta, Georgia. He taught at the University of Maryland from 1974 to 1979, spending his last year there on leave at the U.S. Treasury's Office of Tax Analysis, where he was a Brookings Economic Policy Fellow. In 1979, he took a joint appointment at Duke University, joining both the Institute of Policy Sciences and Public Affairs, and the Economics Department. While at Duke, he has served as vice-provost for academic policy and planning from 1983 to 1985, as vice-chancellor from 1985 to 1988, and as vice-provost for academic programs from 1993 to 1994. He has also served as president of the Southern Economic Association. Professor Clotfelter is also the director of the Center for the Study of Philanthropy and Volunteerism at Duke and is a research associate of the National Bureau of Economic Research. His major research interests are in public finance, tax policy, the economics of education, and the nonprofit sector. He is the author of several books, the most recent of which is *Buying the Best: Cost Escalation in Elite Higher Education* (1996).



James E. Coleman, Jr., *Professor of Law*

A.B. 1970, Harvard University; J.D. 1974, Columbia University. A native of Charlotte, North Carolina, Professor Coleman's experience includes a judicial clerkship for the U.S. District Court for the Eastern District of Michigan, a year in private practice in New York, and fifteen years in private practice in Washington, D.C., the last twelve as a partner in a large law firm. In private practice, he specialized in federal court and administrative litigation; he also represented criminal defendants in capital collateral proceedings. He has had a range of government experience. In 1976, he joined the Legal Services Corporation, where he served for two years as an assistant general counsel. In 1978, he conducted an investigation of two members of Congress as chief counsel for the U.S. House of Representatives' Committee on Standards of Official Conduct. In 1980, he served as a deputy general counsel for the U.S. Department of Education. On sabbatical from his law firm, he was a visitor at Duke Law School for the fall semester of 1989, where he taught a seminar on capital punishment. He joined the faculty full-time in 1991 and taught criminal law, research and writing, and a seminar on capital punishment. He returned to private practice in 1993, but continued to teach a seminar on capital punishment as a senior visiting lecturer. He rejoined the faculty full-time in 1996.



He rejoined the faculty full-time in 1996.

James D. Cox, *Professor of Law*

B.S. 1966, Arizona State University; J.D. 1969, University of California, Hastings College of the Law; LL.M. 1971, Harvard University. Professor Cox is a native of Ellinwood, Kansas. He entered law teaching as a teaching fellow at Boston University, and has since taught at the University of San Francisco, Stanford University, and the University of California, Hastings College of the Law, before coming to Duke in 1979. He has focused his writing and teaching in the areas of corporate and securities law. Professor Cox is the author of a book on the utilization of financial information in the regulation of public corporations, a 1995 multi-volume treatise on corporate law, and a casebook on securities regulations published in 1991. He spent the spring semester of 1989 as a Senior Fulbright Research Fellow at the University of Sydney.





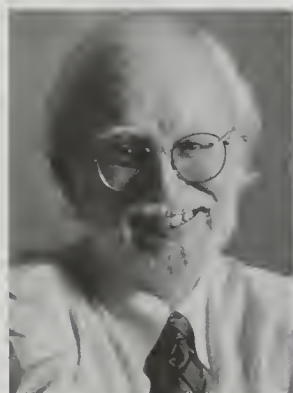
**Jerome M. Culp, Jr., *Professor of Law***

A.B. 1972, University of Chicago; A.M. 1974, J.D. 1978, Harvard University. Professor Culp is a native of Clarksville, Pennsylvania. While in law school he served as senior editor of the *Harvard Civil Rights-Civil Liberties Law Review*. His experience includes a research fellowship with the Rockefeller Foundation and a judicial clerkship in the U.S. Court of Appeals. He came to Duke from Rutgers in 1985, and in 1987 was a distinguished scholar at the Joint Center for Political Studies in Washington, D.C. He has also taught at the University of Michigan, the University of California, Berkeley, and NYU Law School. His principal work to date is in the area of employment discrimination and economic analysis of law. He teaches torts, labor law, employment discrimination, and a seminar on black legal scholarship. In 1991-92, he was on sabbatical leave, in residence at New York University and as John M. Olin Fellow in Law and Economics at the University of California at Berkeley.



**Richard A. Danner, *Research Professor of Law***

B.A. 1969, M.S. 1975, J.D. 1979, University of Wisconsin-Madison. Professor Danner is a native of Wisconsin, who served as environmental law librarian at the University of Wisconsin-Madison, prior to coming to Duke as associate law librarian in 1979. He became director of the Law Library in 1981 and associate dean for library and computing services in 1993. He teaches a seminar in legislation, as well as legal research and writing. He has published articles in journals of law, law librarianship, and library science. He has published two books, *Legal Research in Wisconsin* (1980) and *Strategic Planning: A Law Library Management Tool* (2<sup>nd</sup> ed. 1997) and is the coeditor of *Introduction to Foreign Legal Systems* (1994). From 1984-94, he was editor of the *American Association of Law Libraries' Law Library Journal*. He is active in the affairs of AALL, the International Association of Law Libraries, the ABA Section on Legal Education and Admission to the Bar, AALS, and has served as president of the southeastern chapter of AALL (1985-86) and president of the AALL (1989-90).



**Walter E. Dellinger III, *Douglas Blount Maggs Professor of Law***

A.B. 1963, University of North Carolina; LL.B. 1966, Yale University. Professor Dellinger is a native of Charlotte, North Carolina. He taught political and civil rights at the University of Mississippi from 1966 to 1968. In 1968-69, he served as a judicial clerk in the Supreme Court of the United States. He joined the Duke law faculty in 1969, serving as associate dean from 1974 to 1976 and as acting dean from 1976 to 1978. He has also taught at the University of Southern California, the University of Michigan, and the Catholic University of Leuven, Belgium. He teaches constitutional law and history, and in 1988-89 was a fellow of the National Humanities Center. From 1993 to 1996 he was on leave of absence serving as assistant attorney general, Office of Legal Counsel, at the Department of Justice. He served as acting solicitor general of the United States from July 1996 to July 1997. He returned to the faculty full-time in fall 1997.





**Deborah A. DeMott, Professor of Law**

B.A. 1970, Swarthmore College; J.D. 1973, New York University. Professor DeMott spent her early years in DuBois, Pennsylvania. She served as articles editor of the New York University Law Review. She began her professional career with a judicial clerkship in a federal court in New York City, and later practiced with a large law firm in that city, until she joined the Duke law faculty in 1975. In 1989, she received the Scholar/Teacher of the Year Award from Duke University. She has also taught as a visiting professor at several other law schools in the United States, Canada, and Australia. In 1986 she was a Fulbright Senior Scholar at Sydney and Monash Universities in Australia. She is a member of the North Carolina General Statutes Commission. She is the author of a treatise, *Shareholder Derivative Actions*, published in 1987 and a casebook, *Fiduciary Obligation, Agency and Partnership*, published in 1991. Her other writing concerns corporate law, takeovers and acquisitions, and fiduciary obligation. In 1995, the American Law Institute appointed her the reporter for its new Restatement of Agency.



**Robinson O. Everett, Professor of Law**

A.B. 1947, J.D. 1950, Harvard University; LL.M. 1959, Duke University. Professor Everett is a native of Durham, North Carolina. He served for several years as a legal officer in the Air Force and as a commissioner of the United States Court of Military Appeals. He returned to Durham to enter a general practice, which he continued until 1980 when he ascended to the bench of the United States Court of Military Appeals as chief judge. In September 1990, he retired from this position to become a senior judge of the court and resume full-time teaching. From 1961 to 1964, he served as counsel to the Subcommittee on Constitutional Rights of the United States Senate Judiciary Committee. He has been active in the affairs of the North Carolina Bar, the American Bar Association, and of the community of Durham. He has long served as a commissioner on Uniform State Laws, is a life member of the American Law Institute, and has been active in various law reform efforts. He has published on many legal topics, most notably military justice and criminal procedure. His teaching at Duke began as early as 1950. He was elected to regular membership on the faculty in 1967. In 1993, he founded the Center on Law, Ethics, and National Security at the Law School.



**Karla Fischer, Assistant Professor of Psychology and Assistant Professor of Law**

B.S. 1985, Lewis and Clark College; M.A. 1987, J.D. 1992, Ph.D. 1992, University of Illinois. Professor Fischer joined the Duke University psychology faculty in 1992 and accepted a joint appointment with the Law School in 1993. Her major interests are in the psychological effects of individual participation in the legal system, victimology, as well as gender and social policy.



**Peter G. Fish, *Professor of Political Science and Professor of Law***

A.B. 1960, Princeton University; A.M. 1965, Ph.D. 1968, The Johns Hopkins University. Professor Fish has served as guest scholar at the Brookings Institution and taught at Oberlin and Princeton before coming to Duke in 1969. He is author of *The Politics of Federal Judicial Administration* (1973) and *The Office of the Chief Justice* (1984). From 1977-79 Professor Fish served as a lay member of the United States Circuit Judge Nomination Commission, Panel for the Fourth Circuit. He teaches a seminar on the development of the United States Courts of the Fourth Circuit: 1789-1958.



**Joel L. Fleishman, *Professor of Law and Public Policy Sciences***

A.B. 1955, J.D. 1959, M.A. (Drama) 1959, University of North Carolina; LL.M. 1960, Yale University. Professor Fleishman is a native of Fayetteville, North Carolina. He began his career in 1960 as assistant to the director of the Walter E. Meyer Research Institute of Law at Yale. From 1961 to 1965, he served as legal assistant to the governor of North Carolina. He then returned to Yale, first as director of the Yale Summer High School, and then as associate provost for Urban Studies and Programs. In 1969, he became associate chairman of the Center for the Study of the City and Its Environment and associate director of the Institute of Social Science at Yale. In 1971, he came to Duke as a member of the law faculty and as director of the Institute of Policy Sciences and Public Affairs. In addition to his appointments as professor of law and public policy, he also serves as director of the Samuel and Ronnie Heyman Center for Ethics, Public Policy and the Professions in the Terry Sanford Institute of Public Policy. His principle writings deal with legal regulation and financing of political activities, and he hopes soon to complete a book on ethics in politics.



**Koichiro Fujikura, *Adjunct Professor of Law***

B.A. 1957, Doshisha University; B.A. 1961, Amherst College; LL.M. 1962, Northwestern University; LL.M. 1963, Harvard University. Professor Fujikura returned to Japan after his four years of study in the United States, where he joined the faculty of Doshisha, serving as dean of the law faculty there before moving to the University of Tokyo in 1981; he is currently professor of law at Waseda University in Tokyo. He has also taught at California, Harvard, and Michigan. Among his writings is a book published in English, *Environmental Law in Japan* (1981). He visits Duke in alternate years to teach Japanese environmental law and legal systems.



**Pamela B. Gann, *Professor of Law***

B.A. 1970, University of North Carolina; J.D. 1973, Duke University. A native of Monroe, North Carolina, Professor Gann was articles editor of the *Duke Law Journal*. She practiced with private firms in Atlanta and Charlotte before returning to Duke to teach in 1975. She has also taught at Washington University and the Universities of Michigan, Virginia, Colorado, and San Diego. She is the coeditor of a 1989 casebook on corporate taxation. Her writing is primarily in the areas of taxation and international investment. In 1984, her work was supported by the Council on Foreign Relations, of which she is now a member. She began service as dean of the Law School in 1988.



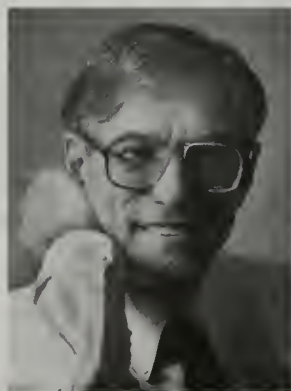
**Xi-Qing Gao, *Adjunct Professor of Law***

B.A. 1978, LL.M. 1981, University of International Business and Economics; J.D. 1986, Duke University. Professor Gao is a native of Xian, People's Republic of China. He was a lecturer of international trade law in the Beijing Institute of Foreign Trade before coming to the United States in 1982 to work for an American law firm. After graduating from Duke Law School in 1986, he was an associate for a large New York City law firm, before returning to China in 1988 to develop a securities market. He served as the general counsel and director of public offerings of the China Securities Regulatory Commission from 1992 to 1995 and is now deputy chief executive of the Bank of China and a professor of law at the University of International Business and Economics. He publishes in the areas of Chinese securities law, banking, and antitrust, and is a member of various international arbitration associations. Professor Gao returns to the Law School each year to teach a course on international business transactions with China and Chinese securities law.



**Martin P. Golding, *Professor of Philosophy and Professor of Law***

B.A. 1949, M.A. 1952, University of California, Los Angeles; Ph.D. 1959, Columbia University. A native of New York City, Professor Golding taught at Columbia University from 1957 to 1970 and at the John Jay College of Criminal Justice of the City University of New York from 1970 to 1976 before coming to Duke in 1976 as professor and chairman of the Department of Philosophy, where he remains as professor. He has also taught at New York University, Bar-Ilan University in Israel, and the Universities of California (both Berkeley and Los Angeles), Southern California, and Colorado. His writing includes three books, *The Nature of Law* (1966), *Philosophy of Law* (1975; Japanese translation 1985; Chinese translation 1988), and *Legal Reasoning* (1984), and numerous articles on jurisprudence and ethics. He is the editor of *Jewish Law and Legal Theory* (1994). Professor Golding was senior visiting Fulbright lecturer in Australia and has been a fellow of the National Humanities Center.





Paul H. Haagen, *Professor of Law*

B.A. 1972, Haverford College; B.A. 1974, M.A. 1976, Oxford; M.A. 1976, Ph.D. 1986, Princeton; J.D. 1982, Yale. Professor Haagen was born in Lancaster, Pennsylvania and raised in Connecticut. After graduating from college, he studied history first at Oxford as a Rhodes Scholar, and later at Princeton, where he also taught. In law school, he was an editor of *Yale Studies in World Public Order* and editor-in-chief of the *Yale Law and Policy Review*. Since law school, he has clerked on the United States Court of Appeals and then practiced law in Philadelphia for two years before coming to Duke in 1985. His principal academic interests are legal history and international law. He was senior associate dean for academic affairs from 1991 to 1993.



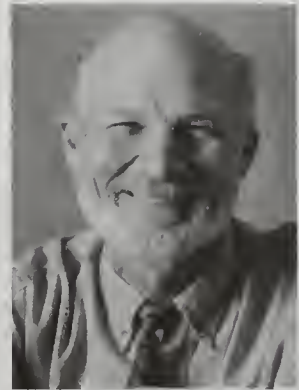
Guy Haarscher, *Adjunct Professor of Law*

J.D. 1971; Ph.D. 1977, Université Libre de Bruxelles. Professor Haarscher is a native of Brussels and has always lived and worked in that city. He is ordinary professor of philosophy and law and director of the Center for the Philosophy of Law at his university. He is secretary general of the Chaim Perelman Foundation and the vice-dean of the faculty of humanities at the ULB. He was a visiting fellow at the Australian National University, and teaches at the Central European University in Budapest and at the European Academy for the Theory of Law in Brussels. He has lectured in various universities, particularly in the United States, and attended many congresses and symposia around the world. Professor Haarscher is the author of several books including: *L'Ontologie de Marx* (1980), *Egalite et Politique* (1982), *Philosophie des Droits de l'Homme* (1987, 4th edition 1994), *La Raison du plus Fort* (1988), and *La laïcité* (1996). He received the prize of the Belgian Academy in 1981 for his book on Marx and the prize of the French Speaking Community of Belgium in 1989 for his book on human rights. He has written many articles on topics related to political philosophy, philosophy of law and general contemporary philosophy. At Duke, he teaches a course on law and political philosophy in alternating years.



Stanley Hauerwas, *Gilbert T. Rowe Professor of Legal Ethics and Professor of Law*

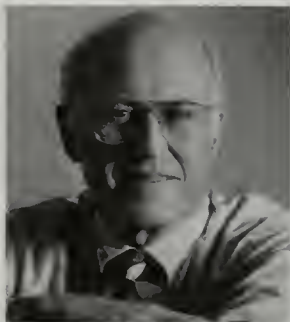
B.A. 1962, Southwestern University; B.D. 1965, M.A., M.Phil., Ph.D. 1968, Yale University. Prior to coming to Duke Divinity School in 1984, Professor Hauerwas taught at Augustana College from 1968 to 1970 and at the University of Notre Dame from 1970 to 1984. While at Notre Dame he was a visiting professor at a number of other American universities. At Duke, Professor Hauerwas is a professor in the Divinity School. He began his association with the Law School in 1988. His primary research interests are in the field of ethics, and his most recent books are *Unleashing the Scripture: Freeing the Bible from Captivity to America* (1993) and *Dispatches from the Front: Theological Engagement with the Secular* (1994).





Clark C. Havighurst, *William Neal Reynolds Professor of Law*

A.B. 1955, Princeton University; J.D. 1958, Northwestern University. Professor Havighurst is a native of Evanston, Illinois. He spent two years in military service, one year as a research associate at Duke, and three years in private law practice in New York City before beginning his teaching career at Duke in 1964. Professor Havighurst was for five years the editor of *Law and Contemporary Problems*. In addition to teaching antitrust law, he has a special academic interest in the field of health care law and in national health policy. His book, *Deregulating the Health Care Industry*, was published in 1982, and his casebook, *Health Care Law and Policy*, appeared in 1988. A new book, *Health Care Choices: Private Contracts as Instruments of Health Reform*, was published in 1995. Professor Havighurst has served as scholar-in-residence at, and is a member of, the Institute of Medicine of the National Academy of Sciences. He has also been a resident consultant to the Federal Trade Commission and to the law firm of Epstein, Becker & Green, both in Washington, D.C., and is an adjunct scholar of the American Enterprise Institute. He has also taught at Stanford, Northwestern, Michigan, and William and Mary.



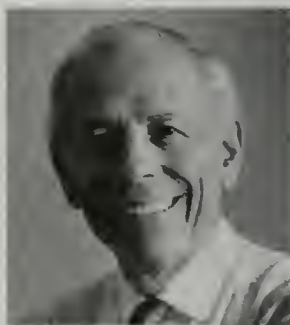
Cynthia B. Herrup, *Professor of History and Professor of Law*

B.S.J. 1972, Northwestern University; M.A. 1975, Loyola University (Chicago); Ph.D. 1982, Northwestern University. Professor Herrup is a native of Miami, Florida. Prior to coming to the Department of History at Duke in 1984, Professor Herrup taught for three years at the University of Michigan. From 1985 to 1988, she had a concurrent appointment at Duke Law School as lecturer in legal history, teaching courses in the history of English criminal law. Her 1985 essay, "Law and Morality in Seventeenth-Century England" won the Walter D. Love prize of the North American Conference on British Studies. In 1987, Cambridge University Press published her book, *The Common Peace? Participation and the Criminal Law in Seventeenth-Century England*. In 1988, Professor Herrup was appointed associate professor of history and law in the Law School. From 1988-91 she was on the board of directors of the American Society for Legal History. Since 1993, she has been on the editorial board of *Law & History Review*. She has held fellowships from the American Association of University Women, Fulbright-Hays, the National Endowment for the Humanities, and the John Simon Guggenheim Memorial Foundation. Her principal research interests are in the area of criminal law in preindustrial societies and the social and intellectual history of ideas of crime and punishment. She teaches history of English criminal law.



Donald L. Horowitz, *James B. Duke Professor of Law and Political Science*

A.B. 1959, LL.B. 1961, Syracuse University; LL.M. 1962, M.A. 1965, Ph.D. 1968, Harvard University. Professor Horowitz began his career as a law clerk in the United States District Court. With the exception of a stint as a government lawyer before joining Duke, he was engaged in research at the Harvard Center for International Affairs, the Woodrow Wilson Center, the Brookings Institution, and the Smithsonian Institution. A recipient of a Guggenheim fellowship, he has published *The Jurocracy*, a book about government lawyers, *The Courts and Social Policy*, for which he was awarded the Louis Brownlow Prize of the National Academy of Public Administration in 1977, and *Ethnic Groups in Conflict* (1985). Professor Horowitz came to Duke in 1981 and has served as a fellow of the National Humanities Center, a visiting fellow at Wolfson College, Cambridge, and a visiting professor at the University of Chicago Law School. His most recent book is *A Democratic South Africa? Constitutional Engineering in a Divided Society* (1991), which won the 1992 Ralph J. Bunche Prize for the best book in ethnic and cultural pluralism. In 1993, Professor Horowitz was elected a fellow of the American Academy of Arts and Sciences. In 1995-96, he was a visiting scholar at the University of Canterbury Law School in New Zealand. His most recent published work is on Islamic law and the theory of legal change.



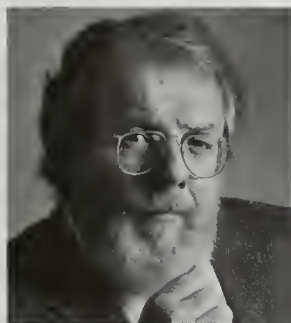
**Trina Jones, Associate Professor of Law**

B.A. 1988, Cornell University; J.D. 1991, University of Michigan. Professor Jones is a native of Rock Hill, South Carolina. During law school, she served as articles editor for the *Michigan Law Review*. From 1991 to 1995, she was an associate in a large Washington, D.C. law firm, working in general litigation. Professor Jones joined the faculty in 1995 and teaches civil procedure and employment discrimination. Her academic interests also include legal ethics and race and gender issues.



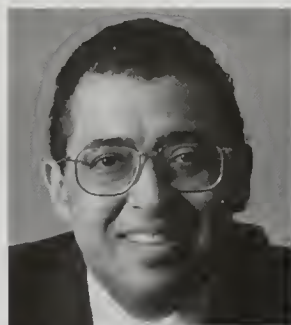
**David L. Lange, Professor of Law**

B.S. 1960, LL.B. 1964, University of Illinois. Professor Lange practiced law with a Chicago firm that included media enterprises among its clients. He has also had substantial professional experience in radio, television, cable, and motion picture production, and has served as a member of the Governing Committee of the ABA Forum on the Entertainment and Sports Industries. He joined the Duke law faculty in 1971, where he has since served as general editor of *Law and Contemporary Problems* and as chairman of the Center for the Study of Communications Policy. His principal academic interests lie in the areas of intellectual property, entertainment, and communications law. He is also of counsel to a law firm with an emphasis in these areas of practice.



**Percy R. Luney, Jr., Adjunct Professor of Law**

A.B. 1970, Hamilton College; J.D. 1974, Harvard University. Professor Luney devoted a year of study to economic geology in the sub-Sahara as a Thomas J. Watson Fellow and taught that subject for a year at Cornell after completing law school. He thereafter practiced law in the Department of the Interior and with a private firm practicing primarily in the land and resource development area. In 1980, he joined the law faculty of North Carolina Central University, where he now serves as dean. He has been a fellow of the North Carolina Japan Center, and was a visiting scholar at the University of Tokyo in 1983, 1986 (as a Fulbright Scholar), and 1990. He was a Fulbright Lecturer on the Kobe University Faculty of Law in 1991-92. At Duke, he teaches in the area of Japanese law.



**Francis E. McGovern, *Professor of Law***

B.A. 1967, Yale University; J.D. 1973, University of Virginia. Professor McGovern is a native of Charlottesville, Virginia. He began his legal career in a large law firm, before joining the faculty at the Cumberland School of Law in Birmingham, Alabama. He has also taught at Boston University School of Law, MIT, Harvard Law School, University of Fribourg (Switzerland), and the University of Alabama School of Law where he was the Francis H. Hare Professor of Torts for ten years. He joined the Duke law faculty in 1997. Professor McGovern was a pioneer in the field of alternative dispute resolution, and especially in the area of mass claim litigation. He has served as a court-appointed special master or neutral expert in dozens of cases, including DDT toxic exposure litigation, the Dalkon Shield controversy, and the silicone gel breast implant litigation. He has worked with the United Nations Compensation Commission to ensure that Iraq compensates for losses suffered in the Persian Gulf War. He is the author of two books, *Successful Litigation Techniques* and *The Preparation of a Product Liability Case*, as well as numerous articles. He teaches in the areas of torts, product liability, mass torts, alternative dispute resolution, and toxic substances litigation.



**Thomas B. Metzloff, *Professor of Law***

B.A. 1976, Yale College; J.D. 1979, Harvard University. Professor Metzloff is a native of Buffalo, New York. He began his professional career with a judicial clerkship on the United States Court of Appeals, followed by a clerkship with the Supreme Court of the United States. He then practiced with a private firm in Atlanta before accepting a position at Duke in 1985. He teaches civil procedure and dispute resolution, as well as courses on professional responsibility and professional liability. He serves as director of the Private Adjudication Center's Medical Malpractice Research Project, and begins service as senior associate dean in 1998.



**Madeline Morris, *Professor of Law***

B.A. 1986, J.D., 1989, Yale University. A native of New York, Professor Morris commenced her legal career with a clerkship for Judge John Minor Wisdom of the United States Court of Appeals for the Fifth Circuit. She joined the Duke faculty in 1990 and is faculty co-director of the Duke/Geneva Institute in Transnational Law. Professor Morris served as advisor on justice to the President of Rwanda, 1995-97, and as special consultant to the Secretary of the U.S. Army, 1997. She was co-convener, in 1996-97, of the Inter-African Cooperation on Truth and Justice program, and served in 1997 as consultant and adjunct faculty member of the U.S. Naval Justice School. Professor Morris is co-director of the Duke Law School Pro Bono Project for Research Support to the Office of the Prosecutor, International Criminal Tribunals for the former Yugoslavia and Rwanda, and a member of the Board of Advisors of the Center on Law, Ethics and National Security, Duke University. She teaches criminal law and international criminal law.





**Robert P. Mosteller, *Professor of Law***

B.A. 1970, University of North Carolina at Chapel Hill; J.D. 1975, Yale University; M.P.P. 1975, Harvard University. Professor Mosteller is a native of Vale, North Carolina. After serving as a judicial clerk in the Fourth Circuit, he joined the District of Columbia Public Defender Service. During seven years with the Public Defender Service, he was director of training and chief of the trial division. Professor Mosteller came to Duke in 1983, and is the coauthor of a casebook, a problem book, and a treatise on evidence. He teaches criminal procedure, evidence, and related seminars.



**Jonathan K. Ocko, *Adjunct Professor of Legal History***

B.A. 1966, Trinity College; M.Phil. 1971, M.A. 1972, Ph.D. 1975, Yale University. A native of New York City, Professor Ocko taught at Clark University and Wellesley College before joining the faculty of North Carolina State University in 1977. He has been a fellow at Harvard Law School and the National Humanities Center and also held fellowships from the Rockefeller, Chiang Ching-kuo, and Luce Foundations. Since publishing *Bureaucratic Reform in Provincial China* in 1983, his research and publications have focused on Chinese legal history and contemporary Chinese civil law. His present work deals with traditional concepts of justice, mediation in Chinese culture, and the concept of contract in Chinese economic culture. In 1983, he was appointed to a part-time professorial position in the Law School.



**H. Jefferson Powell, *Professor of Law and Divinity***

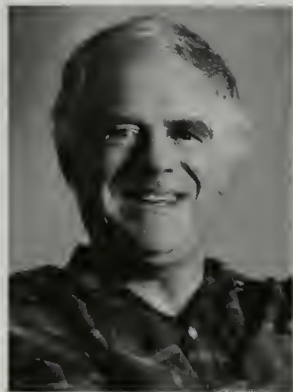
B.A. 1975, University of Wales; M.Div. 1979, J.D. 1982, Yale University; A.M. 1977, Ph.D. 1991, Duke University. A native of Reidsville, North Carolina, Professor Powell clerked for the Honorable Sam J. Ervin III of the Fourth Circuit. He began teaching at the University of Iowa in 1984 and returned to Duke in 1987 to complete his doctorate in theological ethics. In the fall of 1989, Professor Powell joined the permanent faculty of the Law and Divinity Schools. At the Law School, he teaches contracts and constitutional history. From 1991-93 he was special counsel to the attorney general of North Carolina and from 1993-94 and 1996, he served in the U.S. Department of Justice as a deputy assistant attorney general and later as deputy solicitor general.





**William A. Reppy, Jr., *Charles L.B. Lowndes Professor of Law***

A.B. 1963, J.D. 1966, Stanford University. Professor Reppy is a native of Oxnard, California. He commenced his professional career with two judicial clerkships—one in the Supreme Court of California, followed by another in the Supreme Court of the United States. He then practiced law for three years with a private firm in Los Angeles, until joining the Duke law faculty in 1971. He has also taught at the Universities of California, Michigan, Washington, and North Carolina. His principal scholarly work is in the areas of marital property rights and conflict of laws. He is a frequent consultant to the California Law Revision Commission on community property and succession law. He does pro bono legal work for the humane and animal rights movements.



**Thomas D. Rowe, Jr., *Elvin R. Latty Professor of Law***

B.A. 1964, Yale University; M.Phil. 1967, Oxford University; J.D. 1970, Harvard University. A native of Ann Arbor, Michigan, Professor Rowe achieved preeminent academic records both as an undergraduate and as a law student; in the interim, he was also a Rhodes Scholar. He commenced his professional career as a law clerk in the Supreme Court of the United States. He served for one and one-half years as assistant counsel to a subcommittee of the U.S. Senate Judiciary Committee and then practiced law with a private firm in Washington, D.C. He joined the Duke law faculty in 1975 and served as associate dean from 1981 to 1984. He has also taught at Georgetown, Michigan, and Virginia, and on leaves from Duke has served with the U.S. Department of Justice in Washington and worked as an attorney with a private firm in Los Angeles. He has written in the fields of civil procedure, complex litigation, judicial remedies, and constitutional law. In 1995-96, he served as senior associate dean for academic affairs.



**Richard L. Schmalbeck, *Professor of Law***

B.A. 1970, J.D. 1975, University of Chicago. A native of Chicago, Professor Schmalbeck was associate editor of the *University of Chicago Law Review*. After brief service as special assistant to the associate director of the Office of Management and Budget, he practiced law with a firm in Washington, D.C., specializing in federal tax law. He began his teaching career at Duke in 1980, where his focus is on the fields of federal taxation and law and economics. He has been a visiting professor at the University of Michigan and Northwestern University, and served as dean of the College of Law of the University of Illinois from 1990 to 1993.



**Christopher H. Schroeder, *Professor of Law and Public Policy***

B.A.1968, Princeton University; M.Div. 1971, Yale University; J.D. 1974, University of California. Professor Schroeder is a native of Saginaw, Michigan. He served as editor-in-chief of the *California Law Review*. He practiced law with a San Francisco firm for two years before organizing a smaller firm in that city, where he engaged in environmental litigation in addition to a general litigation practice. He joined the Duke law faculty in 1979, and has also taught at UCLA and Boston University. He teaches in the fields of environmental law, property, administrative law, and the Congress. During the fall 1992 semester, he was on leave serving as acting chief counsel of the U.S. Senate Judiciary Committee. For the 1996 fall semester, he served as assistant attorney general in the Office of Legal Counsel, U.S. Department of Justice.



**Steven L. Schwarcz, *Professor of Law***

B.S. 1971, New York University School of Engineering and Science; J.D. 1974, Columbia University. Professor Schwarcz was born and raised in the New York metropolitan area. After graduating first in his class in engineering school, majoring in aeronautics and astronautics, he worked on legislative initiatives involving science and law while attending law school. Prior to joining Duke in 1996, he was a partner and practice group chairman at two major New York law firms, where he represented many of the world's leading banks and other financial institutions in structuring innovative capital market financing transactions, both domestic and international. While practicing law, he taught courses in bankruptcy, corporate reorganization, commercial law, and structured finance at Yale, Columbia and Cardozo (Yeshiva University) Law Schools. He also has written numerous scholarly works in these areas, and his monograph, *Structured Finance, A Guide to the Principles of Asset Securitization* (3rd edition forthcoming), is the most widely used book in the field of inventive commercial finance. He has been an adviser to the United Nations on international receivables financing, and is a fellow of the American College of Commercial Finance Lawyers. In 1996, he gave the Benjamin Weintraub Distinguished Professorship Lecture at Hofstra University School of Law.



**Martin J. Stone, *Professor of Law and Professor of Philosophy***

B.A. 1982, Brandeis University; J.D. 1985, Yale University; B.Phil. 1988, Oxford University; Ph.D. 1996, Harvard University. Professor Stone began his undergraduate education at the University of California, Berkeley, transferring to Brandeis after two years. Following completion of his J.D. in 1985, Professor Stone was a Marshall Scholar at Balliol College, Oxford University where he completed the B.Phil. in philosophy in 1988. He completed the Ph.D. in philosophy at Harvard University in 1996. His research interests center on Wittgenstein, philosophical logic, and political philosophy. His teaching interests include tort law and philosophy of law.



**Laura S. Underkuffler, *Professor of Law***

B.A. 1974, Carleton College; J.D. 1978, William Mitchell College of Law; LL.M. 1987, J.S.D. 1994, Yale Law School. A native of New Jersey, Professor Underkuffler began her legal career with a clerkship in the Eighth Circuit Court of Appeals. She practiced law for six years with a large Minneapolis litigation firm, where she was head of the appellate department from 1983-85. In 1983, she was appointed to the Advisory Committee for the Eighth Circuit Court of Appeals where she served until 1986. She was an attorney with the Minnesota State Public Defender's office for one year, before returning to Yale for graduate study in 1986. At Yale, she was assistant to the dean, research fellow, and tutor in law. Her teaching interests include property, property theory, federal courts, and the administration of criminal justice. She served as special counsel in the U.S. Senate in 1991-92, and was a fellow at the Woodrow Wilson International Center for Scholars in 1993.



**William W. Van Alstyne, *William R. Perkins and Thomas C. Perkins Professor of Law***

B.A. 1955, University of Southern California; J.D. 1958, Stanford University; LL.D. (Hon.) 1976, Wake Forest University; LL.D. (Hon.) 1979, College of William and Mary. A native of California, Professor Van Alstyne was professionally employed first by the California Department of Justice and then by the United States Department of Justice. He began his teaching career at Ohio State University in 1959, coming to Duke in 1965. He has taught at a number of other law schools, including Stanford, the University of California (at Berkeley and at Los Angeles), the Universities of Chicago, Illinois, and Pennsylvania, and in Europe, China, Japan, and Latin America. He studied at the Hague Academy of International Law in 1961 and was a senior fellow at Yale in 1964-65. He has been especially active in the American Association of University Professors, serving as president in 1975-76. He is known for his writing and his speaking on the subject of constitutional law, appearing regularly in House and Senate proceedings and in briefs for the U.S. Supreme Court.



**Neil Vidmar, *Russell M. Robinson, II Professor of Law and Professor of Psychology: Social and Health Sciences***

A.B. 1962, MacMurray College; M.A. 1965, Ph.D. 1967, University of Illinois. Professor Vidmar was raised and educated in Illinois, but moved to Canada in 1967, after completing his graduate work. He taught in the Department of Psychology and the School of Law at the University of Western Ontario until joining the Duke Law faculty in 1989. He has also been engaged in research or teaching during leaves at Yale Law School, the Battelle Seattle Research Center, and Osgoode Hall Law School. He is a former trustee and treasurer of the Law and Society Association. He serves on the editorial boards of a number of law and society publications and as a consultant to legal, scientific, and government organizations in the United States and Canada. Professor Vidmar is the coauthor of *Judging the Jury* (1986), and author of *Medical Malpractice* and *the American Jury* (1995). He has written articles dealing with both the civil and criminal justice system. He offers instruction in social science evidence in law, the psychology of the litigation process, negotiation, and the contemporary American jury.



John C. Weistart, *Professor of Law, A.B. 1965, Illinois Wesleyan University; J.D. 1968, Duke University; LL.D. (Hon.) 1981, Illinois Wesleyan University.*

Professor Weistart was editor-in-chief of the Duke Law Journal. He served for a year as a judicial clerk on the Supreme Court of Illinois before joining the Duke law faculty in 1969. He served for three years as editor of *Law and Contemporary Problems* and as American editor of the *Journal of Business Law*, and is a member of the American Law Institute. He has also taught at the Universities of California at Los Angeles, Virginia, Harvard, Michigan, and Denver. He is known for his writing in the field of commercial law, and has served as a consultant to the Federal Trade Commission and the Federal Reserve Board. He is also a frequent commentator on issues in the athletics industry.



Jonathan B. Wiener, *Associate Professor of Law and Associate Professor of Environment*

A.B. 1984, J.D. 1987, Harvard University. During law school, Professor Wiener was an editor of the *Harvard Law Review*, and helped coach the national collegiate debate champions. After law school he clerked for Judge Jack Weinstein of the U.S. District Court, and then for Judge Stephen Breyer on the U.S. Court of Appeals. He then served as special assistant to the assistant attorney general heading the Environment and Natural Resources Division, Department of Justice; as policy counsel at the Office of Science and Technology Policy, Executive Office of the President; as senior staff economics/attorney at the President's Council of Economic Advisors; and as an advisor to the new AmeriCorps National Service Program. He came to Duke in 1994. His policy work and writing have addressed topics including climate change, forests conservation, risk, biotechnology, mass torts, and incentives in regulation and litigation. Recent publications include *Risk vs. Risk* (Harvard Univ. Press 1995) and "Law and the New Ecology," 22 *Ecol. L.Q.* 325 (1995). He attended the Rio Earth Summit in 1992. Professor Wiener has also helped organize several community service events including the Law School's annual "Dedicated to Durham" day. He teaches in the areas of environmental law, risk regulation, mass torts, and property.





## Visiting Faculty

- Joseph Bylinski, *Adjunct Associate Professor of Law (University of North Carolina, Kenan-Flagler Business School)*  
Lan Cao, *Visiting Assistant Professor of Law (Brooklyn Law School)*  
Frank B. Cross, *Visiting Professor of Law (University of Texas)*  
Robert Nagel, *Visiting Professor of Law (University of Colorado)*  
Randall S. Thomas, *Visiting Professor of Law (University of Iowa)*  
H. Richard Uviller, *Visiting Professor of Law (Columbia University)*

## Extended Faculty

- Catherine Admay, *Lecturing Fellow and Research Associate*  
Cynthia Adcock, *Lecturing Fellow*  
Robert A. Beason, *Senior Lecturing Fellow*  
Charles L. Becton, *Senior Lecturing Fellow*  
Gregory J. Bendlin, *Senior Lecturing Fellow*  
Mark P. Bernstein, *Senior Lecturing Fellow*  
Waltraud R. Bernstein, *Senior Lecturing Fellow*  
Donald H. Beskind, *Senior Lecturing Fellow*  
Doriane Lambelet Coleman, *Senior Lecturing Fellow*  
Jeffrey C. Coyne, *Senior Lecturing Fellow*  
Jasper L. Cummings, Jr., *Senior Lecturing Fellow*  
Diane Dimond, *Senior Lecturing Fellow*  
Thomas Dean Domonoske, *Lecturing Fellow*  
Melanie Dunshee, *Senior Lecturing Fellow*  
René Stemple Ellis, *Senior Lecturing Fellow*  
John Hope Franklin, *Professor of History and Professor of Law (Emeritus)*  
George D. Gopen, *Senior Lecturing Fellow*  
Henderson Hill, *Senior Lecturing Fellow*  
Kenneth J. Hirsh, *Senior Lecturing Fellow*  
Kenichi Inagawa, *Lecturing Fellow*  
Weibo Jiang, *Lecturing Fellow*  
Edward E. Kaufman, *Senior Lecturing Fellow*  
Neil J. Kinkopf, *Lecturing Fellow*  
Karen A. Magri, *Lecturing Fellow*  
Jennifer D'A. Maher, *Senior Lecturing Fellow*  
Thomas K. Maher, *Senior Lecturing Fellow*  
Richard C. Maxwell, *Harry R. Chadwick, Sr., Professor of Law (Emeritus)*  
Carolyn McAllaster, *Senior Lecturing Fellow*  
Agnes Mirandes, *Lecturing Fellow*  
Michael Newcity, *Lecturing Fellow*  
Theresa A. Newman, *Senior Lecturing Fellow*  
Alejandro Posados, *Lecturing Fellow*  
Allison J. Rice, *Senior Lecturing Fellow*  
H. B. Robertson, Jr., *Professor of Law (Emeritus)*  
David S. Rudolf, *Senior Lecturing Fellow*  
Nancy Russell Shaw, *Senior Lecturing Fellow*  
Melvin G. Shimm, *Professor of Law (Emeritus)*  
Kenneth D. Sibley, *Senior Lecturing Fellow*  
Allen G. Siegel, *Senior Lecturing Fellow*  
Scott L. Silliman, *Senior Lecturing Fellow*  
Janet Sinder, *Senior Lecturing Fellow*

Terri A. Southwick, *Senior Lecturing Fellow*  
E. Carol Spruill, *Senior Lecturing Fellow*  
Katherine Topulos, *Senior Lecturing Fellow*  
Stephen Wallenstein, *Senior Lecturing Fellow*  
Jane R. Wettach, *Senior Lecturing Fellow*

*Admissions*



The Law School strives to treat each applicant fairly and with candor. The following description of the admissions process at Duke is presented with that objective in mind.

## **Admissions Standards**

At Duke, as at many law schools, the three most important admissions criteria are the Law School Admission Test (LSAT) score, the undergraduate grade point average (GPA), and the undergraduate institution attended.

Although reliance on purely academic criteria is appropriate in making some decisions, particularly those involving candidates either clearly admissible or clearly inadmissible, the majority of applications fall between these extremes. For these applications, Duke will give careful consideration to more subjective factors such as proven capacity for leadership, dedication to community service, excellence in a particular field, motivation, graduate study in another discipline, work experience, extracurricular activities, and personal and character information provided in letters of recommendation. Also, in interpreting the applicant's GPA, it is often necessary to make judgments regarding the strength of the course of study pursued and the significance of class rank or the progression of grades.

Although no quotas of any kind are employed in the admissions process, the Law School does make a conscious effort to achieve a broad diversity in each entering class in terms of general background, geography, and undergraduate institutions represented. An individual student may be selected not only for his or her marked potential for academic success, but also because application materials indicate that he or she can bring to Duke unique personal qualities or talents that will enhance the overall character of the entering class.

Duke has a faculty-initiated affirmative action plan for minority admissions, and special care is taken in evaluating applications from members of minority groups who traditionally have not been well represented in the legal profession. On occasion, special consideration may be given to North Carolina residents and children of Law School alumni who are qualified to complete the required course of study.

An applicant who has graduated from an accredited college, or one who will have been graduated from an accredited college during his or her course of study at the Law School, may be admitted as a candidate for the degree of Juris Doctor (J.D.).





## Admission Procedures: J.D. Program

The Admissions Committee receives its authority by delegation from the law faculty and reports to the law faculty. The committee, composed of four law professors, two administrative deans or directors, and three law students, decides policy questions arising in the admissions process. Student members of the committee, however, do not review individual files. All individual applications are reviewed by the assistant dean of admissions. Each applicant is responsible for collecting and submitting the following documents:

1. Completed application form obtained from Admissions Office, Duke University School of Law, Box 90393, Durham, North Carolina 27708-0393. Telephone (919) 613-7200. Internet: [admissions@law.duke.edu](mailto:admissions@law.duke.edu).
2. Three completed reference forms, one of which should be written by an appropriate academic dean at the undergraduate school last attended. It is suggested that the other reference forms be written by professors who have personal knowledge of the academic performance and potential of the applicant. References compiled and submitted by an established Career Planning and Placement Office at the applicant's undergraduate school will be accepted. Although academic references are preferred, applicants who have been out of school for some time may substitute letters from employers or others who are well acquainted with their personal traits and intellectual potential.
3. A nonrefundable processing fee of \$65. This application fee is not waivable except in cases of documented extreme personal hardship.
4. Scholarship assistance form. All applicants are required to return this form; those not wishing to be considered for scholarships may so indicate on the form.

Applicants are strongly urged to take the Law School Admission Test (LSAT) no later than December. Registration forms and information should be procured by writing directly to Law Services, Box 2000, Newtown, Pennsylvania 18940. Applicants with disabilities should contact Law Services directly for information concerning special accommodations for taking the LSAT. Only in exceptional cases will Duke waive the LSAT requirement.

Applicants must arrange for the submission of transcripts from all undergraduate and graduate schools attended to the Law School Data Assembly Service (LSDAS), Box 2000, Newtown, Pennsylvania 18940.

Duke has no formal deadline for the submission of applications. However, applicants to the first year class may disadvantage themselves by submitting their applications later than February 1. Review of completed applications begins in December and continues until the class is filled.

Duke has an early action option which allows students whose applications are complete by November 1 to receive a decision (admit, deny, or hold) by December 15. Early action applications are evaluated in the same way and by the same standard as in the regular admissions cycle.

Applicants who visit the Law School are encouraged to talk with currently enrolled students, and may attend a class and meet with an admissions representative if the visit is scheduled in advance.

Each applicant extended an offer of admission will be given a reasonable amount of time to respond. Written offers of admission will be sent to admitted candidates specifying the amount of deposit and other conditions required to hold a place in the class. A waiting list is established in late spring and held open until the registration date. Offers are extended to applicants on the waiting list as withdrawals occur during the summer.

Admission to the Law School is conditional upon receipt of a final official transcript of all undergraduate and graduate work undertaken by the candidate.

## **Admission Procedures: Summer Joint Degree Programs**

Procedures for admission to the summer joint degree programs are no different from those established for the regular J.D. program commencing in the fall semester. Applicants should indicate on the application form that they are applying to the summer program and designate either the LL.M. program offered by the Law School, or the Graduate School department in which they wish to pursue the A.M. or M.S. Applicants to the LL.M. program are selected by the Law School Admissions Committee. The selection process for A.M. and M.S. applicants is bifurcated. Upon a favorable decision by the Law School Admissions Committee, the applicant's file will be forwarded to the appropriate Graduate School department for review. Applicants must be formally admitted to the master's program by the Graduate School.

Students must elect whether they wish to be considered for entrance in the summer or fall, and may not be considered concurrently for admission to both programs. A student wishing to change that election may do so prior to receipt of a final admission decision without payment of an additional processing fee. However, the Admissions Committee will treat the application to the alternate program as newly completed; thus a late change in election may prejudice the applicant's chance for admission. An offer of admission to one program is not transferrable to another program. This policy reflects our need for a firm commitment from applicants regarding which program they wish to enter so that we may deal fairly with all applicants competing for a limited number of spaces in each class. Although applicant pools may change from year to year, our experience has been that competition for spaces is equivalent for the two programs.

## **Other Joint Degree Programs**

Applicants for any of the other joint degree programs offered by the Duke Law School are considered for admission to both schools on the same basis as those applicants who are applying for the individual programs. The admission decision of one school has no bearing on the admission decision of the other school. If accepted for admission by both schools, the applicant is automatically eligible to participate in the established joint degree program. Students planning to participate in such programs should notify the Law School immediately upon their admission.

## **Master of Legal Studies**

Admission to this degree program is limited to persons who have achieved distinction in law-related professional work or who are pursuing law-related graduate degrees in other fields. Application to the program proceeds in exactly the same manner as for the J.D. program, with the single exception that the LSAT is not required of applicants who have taken the Graduate Record Examination in their primary field of study. Applicants who wish to substitute the GRE score should have an official report sent to the admissions office.

## **Reactivating Admissions Files**

If an applicant has applied for admission in a previous year and was not extended an offer of admission or chose not to enter during that academic year, he or she may request that the file be reactivated for consideration by the Admissions Committee. The applicant should update his or her personal statement at that time. A nonrefundable fee of \$65 is charged for processing the application, and a check or money order for this amount must accompany the request for reactivation of the file. The applicant will not be required to re-register with the Law School Data Assembly Service (LSDAS) unless

he or she retakes the LSAT after initially applying to the Law School. An updated transcript will be required to document academic work completed but not reflected on the last LSDAS report received by Duke. Application files are retained for three years.

## Transfer Policy

In order to be considered for admission to Duke, a transfer applicant must present evidence of the satisfactory completion of one year of study at any law school that is a member of the Association of American Law Schools, and be eligible for readmission to that school. To be given serious consideration for admission, an applicant should rank at least in the top third of the class. Two academic years of law study must be completed at Duke.

The following items are required to complete a transfer applicant's admission file:

1. A nonrefundable processing fee of \$65;
2. Letter of certification from the dean of the law school attended;
3. References from two law professors who have personal knowledge of the academic performance and potential of the applicant;
4. Certified transcript of all grades earned in the first year of law school;
5. A copy of undergraduate transcript and LSDAS report.

Spring semester grades must be received before decisions can be made. The deadline for submitting transfer applications is July 1. Decisions are normally made the last week of July.

## Graduate Study in Law

Admission to Duke to pursue law study beyond the basic professional degree is generally limited to J.D./LL.M. candidates and international students. For information about application to the graduate study program, see the description of admission procedures for the summer joint degree program or the section on international students.

## University and Law School Rules

Students are subject to the rules and regulations of the university and the Law School that are currently in effect, or those that in the future may be promulgated by the appropriate authorities of the university. A copy of the Law School Rules is available for review in the Law School Library and on the Law School's World Wide Web site: <http://www.law.duke.edu>. Every student, in accepting admission, indicates a willingness to subscribe to and be governed by these rules and regulations. The student also acknowledges the right of the university to take such disciplinary action, including suspension and/or expulsion, as may be appropriate, for failure to abide by these rules and regulations of academic misconduct, or for other conduct adjudged unsatisfactory or detrimental to the university.

Duke University is a drug-free work place as defined by federal regulations.

[Information about admission to the Duke University School of Law is also available at the Law School's World Wide Web site: <http://www.law.duke.edu>.]



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## *Financial Information*



The cost of providing a legal education of the quality offered by Duke is high and has been steadily increasing. An annual report of the Law School explains in moderate detail what those costs are, and how they are met; a copy is available on request. As the report reveals, the Law School is substantially subvented by the university from its endowment sources. In addition, the Law School has some resources of its own, including generous annual giving support from its alumni. Nevertheless, the bulk of the cost of the program must be borne by the students who receive it.

## Tuition

**J.D., LL.B., and M.L.S. Candidates.** For the academic year 1998-99, entering students in the J.D. program, transfer students, and candidates for the M.L.S. degree will pay a full year's tuition of \$24,400. Students pursuing the J.D./A.M. or the J.D./LL.M. in the summer entering program will pay an additional \$7,750 in tuition for the summer term. Entering students must pay their fall tuition by August 1, 1998. The tuition refund policy is set forth below.

Subsequent years of study toward the J.D. program will be billed at the current tuition rate. In recent years, that rate has been significantly increased each year. Students in joint degree programs will be billed tuition at rates appropriate to their particular programs.

**Graduate Degree Candidates.** Students pursuing the LL.M. degree will pay tuition of \$24,400 in 1998-99 for their single year of instruction. S.J.D. candidates must enroll for two years; tuition for the S.J.D. program for 1998-99 is set at \$24,400.

## Other Fees

**Late Registration Fee.** Students who register in any semester at a date later than that prescribed are required to pay a \$25 penalty.

**Student Health Fee.** A mandatory student health fee of \$430 (\$215 per semester) is charged to all Duke University students. Hospital insurance is available. Cost for the academic year 1998-99 is \$685 for a single student, \$2,163 for family coverage. The hospital insurance policy coverage is for one year.

**Absentia Fee.** Duke Law School students spending one semester or all of their final year of law school at another law school shall be charged an in absentia fee for the semester or semesters "visiting" at another law school. The fee is the greater of (1) ten percent of Duke Law School tuition or (2) the amount that Duke Law School tuition exceeds the tuition at the "visited" school. The fee shall not exceed two-thirds of Duke Law School tuition. Students visiting at Duke will receive no scholarship assistance from Duke Law School.

**Athletic Events Fee.** Law students may secure admission to all regularly scheduled University athletic contests, with the exception of soccer and basketball, held on

University grounds during the entire academic year free of charge. The fee for basketball and soccer is payable in the fall semester. Students may also use the facilities of the Duke golf course upon payment of student green fees.

**Duke Bar Association Fee.** A \$30 fee each semester is due and payable not later than the day of registration for a particular semester. This fee is utilized exclusively to support the activities of the student bar association.

**Parking Fee.** Students wishing to drive to the campus must register a car for the university's parking lots at an annual fee of \$75-\$175, depending on availability of spaces in various open or gated lots.

**Academic Transcript Fee.** The university will charge a one-time academic transcript fee of \$30.

## General Expenses

Applicants should be aware that the following general expense estimate was compiled in the spring of 1998, and for future years appropriate revisions may be necessary to reflect inflationary increases. The best estimate of total living costs for a nine-month academic year excluding tuition and fees is approximately \$12,030 for a single student. Included in the above cost-of-living estimate are current expense levels for lodging, board, books (approximately \$1,050 if purchased new), supplies, transportation, and personal effects. First-year students are also required to own a computer, which can cost up to \$4,000 for a notebook computer. Financial aid awards in most cases cannot be based on proposed budgets in excess of these figures.

## University Policies for Payment of Accounts

**Payment of Accounts for Fall and Spring.** The Office of the Bursar issues invoices for tuition, fees, and other charges approximately four to six weeks prior to the beginning of classes each semester. The total amount due on the invoice is payable by the invoice due date which is normally one or two weeks prior to the beginning of classes. If full payment is not received by the due date, a late payment charge as described below will be assessed on the next invoice and certain restrictions as stated below will be applied. Failure to receive an invoice does not warrant exemption from the payment of tuition and fees nor from the penalties and restrictions. Entering first year students are required to pay tuition, fees, and other charges by August 1, 1998. Students not receiving a bursar invoice should telephone the bursar's office at (919) 684-3531 to request an invoice.

**Penalty Charge.** If the total amount due on an invoice is not received by the invoice due date, a penalty charge will be assessed from the billing date to the due date of that invoice. The penalty will be assessed on the subsequent invoice at an annual rate of 16 percent applied to the past due balance on that invoice. The past due balance is defined as the previous balance less any credits received and any payments received on or before the due date. Students receiving loans and/or scholarships should submit in writing by the late payment date on the invoice to the bursar's office each semester the name and amount of each loan that will satisfy the bursar's invoice to avoid penalty charges. Penalty charges will be assessed students who do not provide loan information to the bursar's office each semester—no exceptions. Mail payments to: Bursar, P.O. Box 651032, Charlotte, NC 28265-1032.

**Restrictions.** An individual will be in default if the total amount due on the student invoice is not paid in full by the due date. An individual who is in default will not be allowed to register for classes, receive a copy of the academic transcript, have academic credits certified, be granted a leave of absence, or receive a diploma at graduation. An individual in default will be withdrawn.

**Tuition Refunds.** Tuition refunds are governed by the following policy. It should be noted that special rules apply to students receiving Title IV loan assistance, which may be obtained from the financial aid office.

1. In the event of death or a call to active duty in the armed services, a full tuition refund is granted.
2. If a first-year student withdraws after the tuition due date for the summer or fall term, up to 50 percent of tuition may be nonrefundable, if the Law School is unable to enroll another qualified applicant because of the student's late withdrawal. First-year students who withdraw after the beginning of classes for the summer or fall term are ineligible for any tuition refund.
3. In all other cases of withdrawal, students or their parents may elect to have tuition charges refunded or carried forward as a credit for later study according to the following schedule:
  - a. withdrawal before the beginning of classes-full refund;
  - b. withdrawal during the first or second week-80 percent;
  - c. withdrawal during the third through fifth week-60 percent;
  - d. withdrawal during the sixth week-20 percent
  - e. withdrawal after the sixth week-no refund; but
  - f. tuition charges paid from grants or loans will be restored to those funds and will not be refunded or carried forward.

## Scholarship Assistance

The Law School offers both merit-based and need-based scholarships to incoming students.

Scholarship awards are generally made in the form of a contract committing the school to a total grant to be disbursed over the student's first five semesters of Law School. This schedule makes more money available early, when it is most needed, since summer savings and permanent job prospects lessen the financial burdens of most students in the third year.

Students seeking scholarship assistance should file a scholarship application at the same time they apply for admission. Scholarship applications are mailed with the admission application. Most scholarship awards are made just following the admission decision, so that applicants may receive the earliest possible notice of the extent of scholarship support available. The fact that a student has applied for financial aid will not affect the decision on the application for admission.

**Need Awards.** The Law School provides a number of scholarships that are intended primarily to aid those students who are most in need of financial assistance. To ensure that full consideration of financial need is possible at the time when most of our scholarship funds are awarded, such students are required to provide accurate information regarding family (student and both parents) income and other relevant circumstances on the Duke scholarship application. Inclusion of information from both parents on the Duke scholarship form is mandatory.

**Merit Awards.** The Law School competes for students with the top institutions in this country. To attract a solid core of outstanding class members, merit scholarships are also offered. Merit, for this purpose, is usually defined as extraordinary academic promise manifested by grades and test scores which are substantially above the class medians. It is not to be supposed that persons receiving such awards are more meritorious, in the broadest sense of that word, than many other entering students whose admissions credentials may seem a bit less unusual. But, it is believed, all students at the school are benefited by the solid assurance that Duke law students as a group are among the most able anywhere.



Note: Students who can demonstrate both financial need and merit should apply for a need-based scholarship, not a merit award. Typically, those who are both needy and meritorious receive slightly higher scholarship amounts than do those who apply for the funds based solely on merit.

**Specially Funded Scholarships.** Many of the Law School's scholarships are funded from general endowment and other Law School revenues. Some scholarship candidates are selected each year for support from one of several specially endowed scholarship funds. The criteria for these named awards vary; all students applying for aid will be considered for any special scholarships for which they may be eligible.

**Upperclass Awards.** Virtually all available scholarship funds are allocated to entering students and to students continuing under a scholarship contract awarded at the time of admission. No additional scholarship funding is available to upperclass students, except for the Estate Planning Conference Scholarship, which was endowed by the Estate Planning Council of Duke University and is awarded to a third-year law student with a particular interest in estate planning and the David H. Siegel Scholarships established by Allen G. Siegel of the Class of 1960, in memory of his father.



## **Title IV Loan Assistance**

Title IV loan assistance is available to qualified students. Students who wish to apply for this assistance must complete the Free Application for Federal Student Aid. To request the Free Application for Federal Student Aid, telephone 1-800-433-3243. Be certain that your request specifies the correct academic year. To obtain more information on federal student financial aid, write to Federal Student Aid Information Center, P.O. Box 84, Washington, DC 20044 to request the booklet "The Student Guide: Financial Aid from the U.S. Department of Education—Grants, Loans, and Work-Study." This booklet is free.

Complete the Free Application for Federal Student Aid. Mail the completed form in the return envelope attached to the Free Application for Federal Student Aid. The U.S. Department of Education will process the Free Application for Federal Student Aid and mail the Student Aid Report (SAR) directly to the student applicant. The student application should verify the information on the SAR. If the information on the SAR is correct, complete, sign, and mail the SAR to the Office of Financial Aid, Duke University School of Law, Box 90363, Durham, NC 27708-0363. If corrections to the SAR are required, follow the instructions on the SAR.

## **Satisfactory Status Policy**

To remain eligible for Title IV funding, a student must maintain a 2.1 cumulative grade point average to remain in good standing at the Law School. A student placed on probation will be allowed one semester to improve his or her grade point average to a 2.1.

## **Non-Need Based Loan Assistance**

The Law School also has other loan programs available to students who need additional loan funds to meet the approved academic period budget. A good credit history (report) is mandatory to receive these loans. To check your credit history contact your credit bureau. For more information about credit bureaus or resolving credit problems, write to: Public Reference, Federal Trade Commission, Washington, DC 20508.

## **Federal Work Study**

The Law School also receives a limited amount of federal work-study funds each year. The school does not recommend that first-year students work, so these funds are reserved for second- and third-year students who are working in the Law School.

## **Loan Forgiveness Program**

Since 1988, Duke Law School has had a loan forgiveness program which assists graduates who accept low-paying public interest or government employment to repay their law school loans. Funds disbursed through this program take the form of a grant. More information about the very generous terms of this program is available from the Office of Admissions and Financial Aid or through the Law School's World Wide Web site: <http://www.law.duke.edu>.

## **Visiting Students**

All financial assistance for visiting students at Duke Law School must be processed through the institution from which the student will receive his or her degree.

*Scholastic Standards*



## Grading

Most courses are generally available only on a graded basis. Independent research, ad hoc seminars and occasionally some other courses may be designated for credit/fail grading by action of the faculty. If a student has previously taken or audited a course for at least an eight-week period, or in other special circumstances, credit/fail grading may be required or authorized in an individual case at the discretion of the instructor and the dean. Grades received in courses taken in other divisions of the university or courses transferred from other law schools are made part of the student's permanent record, but are not included in the Law School grade point average unless the student receives a failing grade.

The Law School uses a slightly modified form of the familiar 4.0 grading system. No official labels, such as specific Honors, High Pass, or A, B, C, etc., are attached to specific points or ranges of grades within the system. As at a number of other major law schools, exceptional performance may be indicated by a grade of 4.1 to 4.5, and grades above 4.0 are roughly the equivalent of an A+ in other systems. Grades below 1.6 are failing.

Classes of forty students or more have a mandatory median grade of 3.1. The standard grade distribution curve is as follows:

| <i>Interval</i>  | <i>Percentage of Class</i> |
|------------------|----------------------------|
| 4.1-4.5          | 0-5%                       |
| 3.6-4.0          | 0-20%                      |
| 3.1-3.5          | 30-40%                     |
| 2.6-3.0          | 30-40%                     |
| 2.1-2.5          | 0-15%                      |
| 1.6-2.0          | 0-10%                      |
| 1.1-1.5(failing) | 0-5%                       |

## Good Standing

Any student who is eligible to continue the study of law who is not on probation shall be in good standing. Those considered ineligible to continue the study of law include (1) any first-year student who has attained a grade-point average of less than 1.9 or who has received failure grades in courses totaling more than eight semester-hours; (2) any student who has received failure grades in courses totaling more than ten semester-hours during the second and third years or whose grade-point average for the second year is less than 2.0; or (3) any student who has been placed on probation and who has failed to comply with the conditions of probation or who at the end of the specified probationary period has not attained or maintained a grade-point



average of at least 2.1. Under certain circumstances a student otherwise ineligible to continue the study of law as a result of academic performance in the first year will be permitted to repeat the first year.

A student will be placed on probation if (1) in the first year, the student has attained a grade-point average of less than 2.3 but not less than 2.0 and who has received failure grades in courses totaling not more than eight semester-hours; (2) the student has repeated the first year and attained a grade-point average of not less than 2.1 but less than 2.3 or who has attained a grade-point average of at least 2.3 but who has received a failure grade in any course; (3) in the second year, the student has attained a grade-point average of less than 2.3 in either semester of that year or who has received failure grades in courses totaling not less than six but not more than ten semester-hours during that year; or (4) in the third year, the student has attained a grade-point average of less than 2.3 in the fifth semester.

## Maximum and Minimum Course Loads

No first-year student may take courses other than those of the required first-year program, except joint degree students under the terms of their joint degree programs, or with the permission of the dean. No student other than a first-year student may take for credit courses totaling more than sixteen hours per semester, except with the permission of the dean.

No student shall take for credit courses totaling less than twelve hours per semester, except with the permission of the dean, and in no event may the student take less than ten hours per semester.

## Attendance and Preparation

Students must regularly attend and prepare for all classes. A student who is excessively absent or grossly unprepared may, in the discretion of the instructor, be denied the right to take a final examination or to submit other required coursework.

## Auditing Courses

Students may audit courses with the written permission of the instructor, but may not audit courses which, in combination with courses taken for academic credit, exceed seventeen hours per semester. The fact that a student has audited a course shall be indicated in the official records of the Law School.

## Examinations

Final examinations are given in most courses at the Law School, and students should expect a final examination unless otherwise announced by the instructor. Students must take final examinations at the regularly scheduled time, unless permission is given by the dean's office. Permission is not normally granted except in extraordinary circumstances such as serious illness, exam scheduling conflicts, or the scheduling of three or more exams within a thirty-six hour period.

## Submission Of Papers

Papers or other required coursework must be submitted no later than the last day of the regularly scheduled examination period of the semester in which the course is offered, unless the instructor sets an earlier deadline. In exceptional individual cases, the instructor may grant an extension, but the extension may not ordinarily be later than the twenty-eighth day following the last day of the examination period. After that date, an incomplete is entered. When an incomplete is entered, the required coursework must be completed by a date set by the instructor or, in the event of a rescheduled

examination, by the dean. In no event may the deadlines be later than the last day of the regularly scheduled examination period for the following semester.

## **Independent Study**

Independent study projects are arranged on an ad hoc basis by the student with an appropriate member of the faculty, and require the submission of a research paper of the kind generally submitted in seminars. A student may not take for credit more than four semester-hours of independent research in any academic year. Credit is awarded on a pass/fail basis.

Occasionally faculty members will agree to supervise a group of five or more students in an ad hoc seminar. Credit obtained from enrollment in ad hoc seminars is included in the four-hour limit for independent study credit per semester, and is awarded on a pass/fail basis.

## **Other Standards and Rules**

Like all academic institutions, the Law School is governed by scholastic standards and rules promulgated by the faculty, which cover such matters as academic misconduct, eligibility to continue the study of law, academic probation, minimum and maximum course loads, examinations, and registration procedures. A complete copy of these rules is available for review in the Law School library and on the Law School's World Wide Web site at <http://www.law.duke.edu/general/info/rules.html>.

*Curriculum*



## Course Offerings

### FIRST-YEAR CURRICULUM

**110. Civil Procedure.** A consideration of the basic problems of civil procedure designed to acquaint students with the fundamental stages and concerns of litigation—for example, jurisdiction, pleading, discovery, trial, choice of law, and multi-party actions. In addition, this course will highlight a number of specialized topics including the role of juries in deciding civil disputes, the ethical responsibilities of the litigation attorney, and the development of alternative dispute resolution systems. At several points, this course will focus on an analysis of the procedural system's operations as revealed through empirical studies. 4.5 units. *Carrington, Jones, or Metzloff*

**120. Constitutional Law.** An examination of the distribution of and limitations upon governmental authority under the Constitution of the United States. Included are study of the doctrine of judicial review of legislative and executive action, the powers of Congress and the president, the limitations on state governmental powers resulting from the existence or exercise of congressional power, and judicial protection against the exercise of governmental power in violation of rights, liberties, privileges, or immunities conferred by the Constitution. 4.5 units. *Nagel or Van Alstyne*

**130. Contracts.** The formation and legal operations of contracts, their assignment, their significance to third parties, and their relationship to restitution and commercial law developments; the variety, scope, and limitations on remedies; and the policies, jurisprudence, and historical development of promissory liability. 4.5 units. *Bartlett, Haagen, Powell, or Weistart*

**140. Criminal Law.** An introductory study of the law of crimes and the administration of criminal justice, including analysis of the criminal act and the mental element in crime, consideration of specific offenses as defined by statute and the common law, and discussion of typical defenses in relation to specific crimes. One of the purposes of this course is to introduce the students to the nature of social control mechanisms and the role of law in a civilized society. 4.5 units. *Beale, J. Coleman, Everett, or Morris*

**160. Legal Research and Writing.** An introductory study of the various forms of legal writing and modes of legal research. Through an integrated approach to writing and research, the course begins by analyzing the components of judicial opinions and ends with the students independently researching and writing a sophisticated appel-



late brief. The principal goal of this course is the mastery of the basic tools of legal analysis, the principles of legal writing, and the techniques of legal research using both print and on-line resources. Year-long course—total 3 units; per semester 1.5 units. *Bendlin, Dimond, Domonoske, Rice, or Wettach*

**170. Property.** A study of the basic concepts of real property law and conveyancing, including historical background; estates in land, including the fee simple, the fee tail with its statutory substitutes, the life estate, the estate for years, and other nonfreeholds; concurrent ownership; types of future interests; conveyances before and after the Statute of Uses; landlord and tenant; the modern deed-kinds, delivery, description, title covenants, and agreements running with the land at law and in equity; easements; and recording and title registration. 4.5 units. *Reppy, Underkuffler, or Wiener*

**180. Torts.** An analysis of liability for personal injuries and injuries to property. The law of negligence occupies a central place in the course content, but this course also considers other aspects of tort liability such as strict liability, liability of producers and sellers of products, nuisance, liability for defamation and invasion of privacy, and commercial torts. The subjects of causation, damages, insurance (including automobile no-fault compensation systems), and workmen's compensation are also included. 4.5 units. *Christie, D. L. Coleman, or Stone*

## Upper-Class Curriculum

In the absence of special authorization from the dean, each student is required to take in each semester courses aggregating not less than twelve and not more than sixteen semester hours in order to be considered a full-time student for purposes of meeting the residency requirement for the J.D. degree.

The program in the second and third years is entirely elective. In planning his or her program, however, the student should bear in mind that certain more basic courses may be prerequisites to other more advanced courses, and that for this reason—as well as to avoid possible schedule conflicts—it is generally advisable to take these more basic courses in the second year.

Those offerings listed as courses are open to large enrollments. Those listed as clinical have limited enrollment in order to permit close supervision of the professional work students perform. Those listed as seminars are also limited in size and engage the students in research projects with the instructor. C-L: denotes a course offered in another part of Duke University that is cross-listed and may be taken for Law School credit.

## MASTER OF LAWS COURSES

**190. Distinctive Aspects of United States Law.** This course will introduce international students to several of the distinctive aspects of U.S. law in the context of international business disputes litigated in U.S. courts. The focus of the course will be on civil litigation including the dual federal and state court system, the discovery process under the Federal Rules of Civil Procedure, the use of expert witnesses by parties, class actions, the civil jury, and punitive damages. 1 unit. *D. L. Coleman*

**195. Legal Research and Writing for International Students.** A research and writing tutorial designed to introduce international students to the techniques of case and statutory analysis as well as the tools and methods of legal research. Students are expected to complete written assignments and memoranda of law. 2 units. *J. Maher*

## BASIC COURSES

Courses under this subheading that are listed as taught by *Staff* are unlikely to

be offered during the 1998-99 academic year.

**200. Administrative Law.** A study of administrative agencies and legislative authority, information gathering and withholding, rule-making and order-formulating proceedings, judicial review of administrative actions, and constitutional limitations on administrative powers. 3 units. *Cross*

**205. Antitrust.** A study of the federal antitrust laws and the policy of using competition to control private economic behavior. 4 units. *Havighurst*

**210. Business Associations.** An examination of the state and federal law pertinent to corporations and, to a lesser extent, partnerships as business entities. Detailed attention is given to the legal ground rules for the life cycles of corporations—to their organization, preincorporation transactions, basic financial structure, internal governance arrangements, dissolution, and other fundamental changes. Further, a detailed study is made of those portions of the federal securities law that most closely affect the organic law of the corporation—federal regulation of the proxy system and of tender offers and federal restraints on inside trading and on certain other transactions in securities. 4 units. *DeMott or Thomas*

**215. Commercial Transactions.** A study of basic policy choices made in the structuring of the law governing commercial transactions. The course serves as an introduction to debt arrangements, payment systems, and used to allocate losses among commercial parties and to promote or disadvantage particular interests. An important objective of the course is developing student skills in dealing with a highly integrated statute. 4 units. *Weistart*

**218. Comparative Law: Western Legal Traditions.** A comparative study of civil law and common law systems, focusing on legal institutions, legal actors, their roles and backgrounds. This course will examine dissimilarities as well as the shared Western legal and intellectual heritage and analyze selected problem areas. 3 units. *Bernstein*

**220. Conflict of Laws.** A study of the special problems that arise when the significant facts of a case are connected with more than one jurisdiction, including recognition and effect of foreign judgments, choice of law, federal courts and conflict of laws, and the United States Constitution and conflict of laws. 3 units. *Reppy*

**225. Criminal Procedure: Formal.** A study of the basic rules of criminal procedure, beginning with the institution of formal proceedings. Subjects to be covered include prosecutorial discretion, the preliminary hearing, the grand jury, criminal discovery, guilty pleas and plea bargaining, jury selection, pretrial publicity, double jeopardy, the right to counsel, and professional ethics in criminal cases. 3 units. *Everett*

**226. Criminal Procedure: Police.** A study of the legal restrictions on police investigative practice which typically precede institution of formal proceedings, with special emphasis upon "stop and frisk," arrest, search and seizure, confession suppression, electronic surveillance, and operation of the exclusionary rule. 4 units. *Uviller*

**232. Employment Discrimination.** A study of the law of employment discrimination, focusing mainly on federal law prohibiting race, sex, age, and handicapped discrimination. This course provides a basic knowledge of statutory coverage, standards, procedures and proof, and avenues of relief. Class discussion emphasizes important issues arising in current cases: for example, reverse discrimination versus affirmative action, the controversial "comparable worth" concept in equal pay litigation, and the "bottomline" defense to test invalidation. 3 units. *Jones*

**235. Environmental Law.** A basic examination of the rapidly growing body of law concerned with interrelationships between human activities and the larger environment. Rationales for environmental protection; risk assessment and priorities; roles of markets and governments; choice of legal approaches to risk management; roles of different branches and levels of government, and of nongovernmental actors; interplay of scientific, economic, social, and other factors in development and consequences of environmental law. Analysis of common law and statutory regimes for air, water, hazardous waste and toxics, resource use, and biodiversity and ecosystems. Focus on U.S. legal system with some illustrations from foreign, international, and global contexts. 3 units. *Cross*

**238. Ethics and the Law of Lawyering.** Examination in detail of the "law of lawyering" relating to issues as formation of the attorney-client relationship, conflicts of interest, confidentiality, communications with clients, areas where specific rules and regulations controlling lawyer behavior are in effect. Examination of professional responsibility issues in light of applicable court decisions, statutory rules, and administrative regulation. Study of aspirational concerns relating to a lawyer's role in American society. Exploration of a number of issues relating to the ethics of lawyering such as the ramifications of adversarial process. 3 units. *Metzloff or Newman*

**240. European Union Law.** An introduction to the constitutional and substantive law of the European Union, including: the origins and institutions of the European Union; the relationship of European Union law and national law; the enforcement of European Union law; and freedom of movement of goods, persons, and services; sex discrimination; foreign relations competence of the European Union. 3 units. *Bernstein*

**245. Evidence.** A study of the theory and rules governing presentation of evidence to a judicial tribunal, including the concept of relevancy; character evidence; judicial notice; real and demonstrative evidence; expert testimony; authentication of writings; the best evidence rule; competency, impeachment and rehabilitation of witnesses; hearsay and the exceptions to its exclusion; and privileged communications. 3 units. *Mosteller*

**250. Family Law.** A study of legal and policy issues relating to the family, including marriage and divorce. Topics include requirements to marriage, unmarried cohabitation, marital contracts, equitable distribution at divorce, spousal support, child custody, and child support. In addition to a three-hour final examination, all students must negotiate a separation agreement. 3 units. *Bartlett*

**255. Federal Income Taxation.** An introduction to federal income taxation, with emphasis on the determination of income subject to taxation, deductions in computing taxable income, the proper time period for reporting income and deduction, and the proper taxpayer on which to impose the tax. 4 units. *Schmalbeck*

**260. Financial Information.** Many attorneys are required to evaluate financial data, notably financial statements from corporations, on a regular basis. The need is not limited to corporate attorneys; indeed litigators in securities, antitrust, malpractice, or general commercial litigation frequently must analyze financial information. Proper evaluation requires a familiarity with accounting principles and practices. This course serves to both introduce basic accounting principles and practices and their relationship to the law, as well as to study a number of contemporary accounting problems relating to financial disclosure and the accountant's professional responsibility. 3 units. *Bylinski*

**265. First Amendment.** The basic constitutional law of the free speech-free press clause and the church-state clauses of the first amendment. 4 units. *Van Alstyne*



**267. Insurance Law.** An examination of the nature of insurance and the insurance contract. Possible topics include: the role of risk classification, marketing, the principle of indemnity and the notion of an insurable interest, subrogation, the risks transferred, rights at variance with policy provisions, claims processes, and justifications for and the nature of regulation of insurance institutions. 3 units. *Staff*

**270. Intellectual Property.** A comprehensive introduction to the principal theories of trademark law and unfair competition, patent law, copyright law, and related state and federal doctrines. NOTE: Intellectual Property is a prerequisite for Law 322 (Copyright), 369 (Patent), 393 (Trademark), and 530 (Entertainment). 3 units. *Magri*

**275. International Law.** An introduction to public international law, including: the nature and sources of international law; its place in national and international decision making, and its impact on U.S. law; the positions of international organizations, states, and persons in the international legal system; principles concerning state sovereignty, territory, and jurisdiction; foreign sovereign immunity and the act of state doctrine; the law of treaties; state responsibility; international dispute settlement; the use of force; the roles of the United Nations. Foundational course providing both a survey of the field and a platform for more specialized international courses. See the web for additional information. 3 units. *Cao*

**277. Introduction to International Development.** Introduction to international development from normative viewpoint. Exploration of goals and methods used to advance them, including all views and perspectives on difficult normative issues. An overview of international and bilateral aid regimes, use of participatory and grassroots development versus centralized planning, application of appropriate technology, agricultural development, relationship between development and human rights. Examination of the possibility and desirability of transplanting legal institutions and law from developed nations and the issue of whether international assistance policy and practice can be brought to bear at home. 3 units. *Admay*

**280. Jurisprudence.** A historical examination of the development of legal philosophy from ancient times to contemporary period. Detailed examination of Aristotle's work on justice, his concept of political life in the ideal state. Study of various schools of natural law and areas in which natural philosophy enters contemporary legal thought. Time devoted to development of modern legal positivism and various types of legal philosophy derived from it, such as legal realism and contemporary work exploring basic analytical structure of the legal system. The course will give students the historical and philosophical background to engage in discussions of contemporary jurisprudential issues. 3 units. *Christie*

**285. Labor Relations.** A study of the law of labor-management relations, centering upon the National Labor Relations Act, as amended. This course investigates problems involved in the regulation of industrial conflict (strikes, picketing, boycotts, and unfair labor practices by employers), the establishment of the collective bargaining relationship, the negotiation and enforcement of the collective agreement, the arbitration of disputes under the agreement, the relationship between the union and its members, and the protection of individual and minority rights. 3 units. *Horowitz*

**287. Principles of Commercial and Bankruptcy Law.** Introduction to principles and concepts of commercial law and bankruptcy and their interplay. Brief overview of innovative aspects of sales law, letters of credit, documents of title, negotiable instruments. Focus on secured transactions under Article 9 of the UCC, concepts of security interests, collateral, perfection and priority, foreclosure. Property of a bankrupt debtor's estate, automatic stay of foreclosure action, use of property subject to security



interest, adequate protection of secured party's interest, fraudulent conveyances, rejection of executory contracts, bankruptcy trustees, avoiding powers, preferences, post-petition effect, set-offs, subordination. 4 units. *Schwarcz*

**290. Remedies.** An examination of the principles governing the use of judicial remedies, such as damages, injunctions, and declaratory judgments, in a variety of public and private law settings. The course will consider the goals of remedies doctrines and the relationship of the doctrines to other facets of the legal system. Topics will include recent developments in remedies law concerning such areas as school desegregation, consent decrees in civil rights suits, and punitive damages, which highlight the tensions underlying remedies principles. 3 units. *Staff*

**295. Trusts and Estates.** An examination of noncommercial property dispositions, both testamentary and inter vivos, including the following topics: intestate succession, wills and will substitutes; creation and characteristics of trusts; powers of appointment; problems in trust and estate administration. 3 units. *Shaw*

### ADVANCED COURSES

Courses under this subheading that are listed as taught by *Staff* are unlikely to be offered during the 1998-99 academic year.

**301. AIDS Law.** The course will encompass substantive law issues raised by clients with HIV/AIDS. It will employ a multidisciplinary approach to teaching about the legal problems faced by persons with HIV and will involve collaboration with medical and marketing specialists, social workers, and clients. Topics include estate planning, AIDS pharmaceuticals, public benefits, health care issues, permanency planning for children and other family law issues, insurance and employee benefit issues, public health issues, housing and employment discrimination, torts and HIV-related private lawsuits, criminal law issues. 2 units. *McAllaster*

**303. American Legal History.** Social history of American law from the founding of the Jamestown colony through the civil rights movement. Much legal debate is grounded in assumptions; course provides a perspective on that past, and the richness of American legal tradition. Focus on specific historical events and context as a way of understanding broad general themes. Topics include founding of European settlements in North America, relations between colonists and native peoples, witch trials, legal proof, experiments with constitutionalism, limitation revolutionary principles, role of courts and judges, changing principles of tort and contract law, response to changes, criminal law and slavery, railroad regulation, industrial accidents, and civil rights movement. 3 units. *Haagen*

**305. Banking Regulation.** Examination of the regulation of domestically-owned banks and related depository institutions in the United States. Review of the development of modern banking regulation paying close attention to the major public policy issues of the day, from monetary policy to consumer protection and lending discrimination. Students introduced to the complex business of banking, the wide range of supervisory responsibilities of banking regulators, the delicate balance between federal and state interests. 2 units. *Staff*

**307. Business Torts.** The focus of many tort cases has shifted from personal injury to economic losses caused by fraud, misrepresentation, and interference with contractual relations and prospective advantage. This course will consider a wide range of business related tort causes of action, the procedures by which they are litigated, and the strategies and tactics used by attorneys primarily in the interest of the health care industry. 3 units. *Staff*

**308. Bankruptcy.** A study of the rights of debtors under federal bankruptcy law and the corresponding rights of secured and unsecured creditors. Examination of the various types of bankruptcy proceedings that are available and requirements for filing under each, rules for determining rights of and payments to various kinds of claimants, powers available to the trustee to undo transfers of property, and rules determining which obligations are dischargeable by the debtor. 3 units. *Staff*

**309. Children and the Law.** Survey of laws concerning children, including responsibilities of state and family of the child; legal treatment of abused and neglected children; medical treatment of children; adoption; treatment of children accused of crimes; child labor laws. Focus on U.S. laws and policies, as well as international and comparative analysis. Comparison of the role of government in the care of children in the U.S. and other nations' courts to determine eligibility for adoption and treatment of children accused of crimes. The course will address the International Convention on the Rights of the Child. 3 units. *D. L. Coleman*

**310. Collective Bargaining.** A comprehensive treatment of the legal and practical aspects of negotiating a collective bargaining agreement in both the public and private sectors. Student participation together with practical demonstrations relating to arbitrations and typical bargaining problems. Study of all of the component parts of the collective bargaining process. Includes guest lecturers in the fields of arbitration, union organizing, implications of civil rights legislation, and public policy implications. Law 285 is recommended. Of interest to students seeking careers in employment or commercial law. 3 units. *Siegel*

**312. Community Property.** A survey of the marital property laws of Arizona, California, Idaho, Louisiana, Nevada, New Mexico, Texas, Washington, and Wisconsin, with comparison to the Spanish system. Students may concentrate their studies on the law of one of the nine states. 2 units. *Staff*

**315. Complex Civil Litigation.** In many respects an advanced civil procedure class, this course will focus on the problems of large multi-party and multi-forum civil cases and how courts and litigants deal with them. Coverage will include: joinder devices, especially (but not only) class actions; federal multi-district transfer and consolidation; big-case discovery problems; case management techniques and issues; ways of accelerating or terminating potentially or actually protracted cases, including settlement, alternative dispute resolution, representative trials, and claims processing facilities; attorney fee awards; preclusion; and possible reforms. Ordinarily offered in alternate years; unlikely to be offered in the academic year 1999-2000. 3 units. *Rowe*

**320. Constitutional History: The Modern Era.** The contemporary law of the U.S. Constitution is the end product of over two centuries of legal and political development, in the course of which a rich, conflicted tradition of discussion and debate has emerged as the mode by which this society resolves many of its basic debates over questions of political power and social morality. This course examines the history of that tradition from the founding era to the Reconstruction period. Special attention given to early views of national authority, the rise of Jeffersonian democracy, slavery as a constitutional issue, and developments during the Civil War and Reconstruction. 3 units. *Staff*

**322. Advanced Copyright Law.** Instruction in advanced copyright law with particular emphasis on contemporary practice, theory, and current literature in the field. Substantial attention will be paid to issues in the Internet environment (for example, copyright protection and infringement liability in cyberspace). Prerequisite: prior enrollment in Law 270. 2 units. *Southwick*

**323. Corporate Reorganization and Bankruptcy.** Examination of legal and financial conflicts arising public firms' use of debt; Bankruptcy Code's standards for corporate organization, such as absolute priority, cram-down, equitable subordination, consolidation of financial structure of holding companies; how those standards affect prebankruptcy financing transactions; destructive bankruptcy problems arising from extensive use of junk bonds; implications of economic and financial theory for corporate reorganization policy. 2 units. *Schwarz*

**324. Corporate Restructuring.** See C-L: Business Administration 455. 3 units. *Bradley and Dammon*

**325. Corporate Finance.** Focus on three distinct but interrelated components: an introduction to the social science discipline of financial economics, the application of valuation methodology in corporate transactional contexts, and an examination of the legal norms and economic constraints that affect firm financing and capital structure. Investment securities other than common stock (bonds, debentures, preferred stock, and convertible securities) examined in depth. Exploration of the potential and limits of contracting as a device fairly to allocate risk in dynamic, multiplayer financial markets. Law students completing the course will be sufficiently familiar with valuation techniques to take Law 324. 3 units. *Bradley and DeMott*

**326. Corporate Taxation.** A study of the special provisions of the Internal Revenue Code concerning the tax effects of the major events that occur in the life span of a corporation, including the taxation of distributions to shareholders and the formation, reorganization, and liquidation of corporations. Prerequisite: Law 255. 3 units. *Cummings*

**330. Criminal Law: Federal.** A study of federal criminal jurisdiction and selected federal crimes, including the major offenses used to prosecute political corruption at the federal, state, and local level, drug offenses, conspiracy and organized crime (RICO), forfeiture, and the sentencing guidelines, with an emphasis on the exercise of prosecutorial discretion in the federal system. A paper and participation in two simulated appeals are required, and enrollment is limited to 24 students. For additional information see the law school web site. 3 units. *Beale*

**335. Economic Analysis of the Law.** The course begins with a brief overview of elementary microeconomic theory, using examples drawn from various legal fields. It then explores the theory that the development of the common law can best be explained as a pursuit of efficient legal rules. Finally, application of economic theory to selected special topics in the law is examined. 3 units. *Staff*

**336. Economic Regulation in Japan.** Examination of the economic regulations of Japan in comparison with the United States, (primary focus on Japan) by exploring some basic assumptions and differences of their regulatory approaches. Characteristics of regulatory styles discussed in the context of deregulation and privatization, centralized versus decentralized control, consensus-based versus rule-oriented regulations. Students contribute by choosing topics of individual interest such as telecommunications, distribution, financial institutions, land use and housing, employment and labor, and medical care and welfare. 2 units. *Staff*

**340. Estate and Gift Taxation.** A study of the rules governing federal taxation of wealth transfers. Prerequisite: Law 255 (may be taken concurrently); a prior or concurrent enrollment in Law 295 is recommended. 3 units. *Shaw*

**342. Federal Courts.** Ways in which federalism and the separation of powers affect federal courts and relations with other branches and the states. The jurisdiction of the



federal courts, original and appellate: justiciability, Congressional authority to define and limit, diversity and federal question jurisdiction, removal, and supplemental jurisdiction; some aspects of the law applicable in federal court: *Erie*, federal common law, implied rights of action, civil rights actions and immunities of officials and governments; statutory and decisional abstention requirements; and judgments: direct review of state and federal decisions, federal-state res judicata, and collateral attack via habeas corpus. 4 units. *Rowe*

**343. Fiduciary Obligation.** Examination of the operation and significance of fiduciary obligation (obligation to be loyal to the interests of another person in preference to self-interest). Relationship to contract law. Common themes and problems in relationships subject to fiduciary norms. The law governing agency and partnership, relationships in which fiduciary obligation is intrinsic. The increasing application of fiduciary norms, obligations to act in good faith, long-term commercial relationships. Examples of complex statutory schemes, such as those regulating employee benefit plans and investment advisers, that impose fiduciary obligations on persons serving in designated capacities. 3 units. *Staff*

**344. Fundamentals of Commercial Law: Debt and Security.** A study of commercial and consumer credit with primary emphasis on Article 9 of the Uniform Commercial Code. Examination of state law rules governing collection of debt in the absence of security. Focus on security interests under Article 9 including requirements for the creation of such interests, rules governing priority disputes among secured creditors, and rights enjoyed by a secured creditor upon the debtor's default. 3 units. *Staff*

**345. Gender and Law.** This course examines topics in law relating to the law's treatment of and impact on women through a series of different theoretical perspectives that produce alternative understandings of the relationships between gender and law. Theoretical perspectives include formal equality, substantive equality, dominance theory, different voice theory, autonomy, and postmodern anti-essentialism. Substantive topics range from government benefits, family law, employment, domestic violence, and education to rape, contraception, abortion, and adolescent pregnancy. The course emphasizes relationships between theory and practice. 3 units. *Bartlett*

**347. Health Care Law and Policy.** A survey of the legal environment of the health services industry in a policy perspective, with particular attention to the tensions and trade-offs between quality and cost concerns. Topics for study: access to health care; the clash between professionalism and commercialism, including antitrust law; personnel licensure; private personnel credentialing and institutional accreditation; hospital organization and staff privileges; professional and institutional liability; cost-containment regulation, including certification of need; cost controls in government programs. Of interest to students interested in public policy and in law and economics as well as those with specific interests in the health care field. 3 units. *Havighurst*

**352. International Business Transactions.** A case-study approach to drafting and negotiating documentation for complex, multijurisdictional international business transaction. Primary focus on the legal and practical aspects of multinational transactions, particularly in emerging markets; secondary focus on the broader political, social, and normative implications of such transactions. Topics include: international licensing, joint ventures, international securities offerings, concessions, debt swaps, and privatization. 3 units. *Wallenstein*

**354. International Human Rights.** A critical discussion of topics including protection of human rights in the framework of the UN; legal and historical analysis of the 1948 Covenants including Optional Protocol; the system of the European Convention



on Human Rights; reasoning and deciding of the Commission and the Court, and a comparison with American courts. Discussion of some problems including "generations of human rights" and possible conflicts between them; possible tensions between protection of minorities; meaning of the international criminal tribunals; relationships between civil rights, citizenship and globalization; compatibility between affirmative action procedures and individual rights; philosophical foundations of human rights. 2 units. *Haarscher*

**356. International Litigation and Arbitration.** Students make oral responses to problems based on actual cases. Problems require interpretation of selected provisions of the Constitution, Judicial Code, Federal Arbitration Act, international conventions, Federal Rules of Civil Procedure, Uniform Commercial Code, and the Uniform Foreign Money Judgement Enforcement Act. Topics include jurisdictions of state and federal courts over transnational matters, foreign nationals and their assets, applicability of federal or state law to transnational events and disputes, making and enforcing arbitration agreements and awards. See the web for more information. 4 units. *Staff*

**358. International Organizations.** An examination of the legal issues involved in the structure, functions, and operations of the United Nations and other international organizations within the international systems. Special attention will be given to International Organizations in Europe. 2 units. *Staff*

**360. International Taxation.** An examination of the federal income tax imposed on income earned in foreign countries either by citizens and residents of the United States or by foreign corporations that are controlled by citizens and residents of the United States. This course also includes a study of the federal income tax imposed on nonresident aliens and foreign corporations on their income derived from United States sources. Prerequisite: Law 255 or consent of instructor. 2 units. *Shaw*

**361. International Trade.** This course examines various topics related to the conduct of international business. Subjects covered are international private trade, including private international contracts, dispute resolution, and letters of credit; national and international regulation of trade in goods, including the GATT; international regulation of monetary affairs through the IMF; foreign direct investment and transfer of technology. 3 units. *Verrill*

**362. Law and Emerging Markets: Russia and the Former Soviet Union.** Analysis of legal aspects of trade and investment in Russia. A concentrated and practical understanding of the problems associated with trade and investment in contemporary Russia as well as policies and conditions that determine specific issues. Topics covered include Russian legal environment; property ownership and privatization; company law and securities regulation; currency and foreign exchange; taxation; corruption and implications; civil and commercial law; intellectual property protection; judicial reform and dispute resolution. 3 units. *Newcity*

**363. Legislation.** A study of the factors involved in the development and passage of legislation, and in its interpretation by the courts. Topics covered include theories of legislation, legislative procedure and process, problems in drafting statutes, compilation of legislative histories, and determination of legislative intent. Research paper or examination. 2 units. *Danner*

**364. Japanese Business Law.** Examination of the laws and practice governing Japanese businesses and business transactions including business environment, Japanese attitude toward contracts, negotiation and formation of contracts, products liability, and corporate law. Comparison drawn to the relevant domestic law. 2 units. *Staff*

**369. Patent Law and Trade Secrets.** An overview of the legal framework for patents, including statutory requirements for patentability, disclosure requirements, infringement analysis, special problems of collaborative and competitive research, international issues, and the role of patent counsel in litigation. Prerequisite: Law 270. 3 units. *Sibley*

**371. Products Liability.** A general survey of the substantive law of products liability including tort law with an emphasis on strict liability in tort, contract law with an emphasis on warranty, and legislation and administrative law. A review of federal and state rules of civil procedure, particularly regarding discovery, as they apply in the products liability context. Finally, a focus on a limited number of specialized product areas to consider theoretical and practical aspects of handling products liability litigation. 3 units. *McGovern*

**372. Professional Liability.** The past fifteen years have seen a significant increase in the number, as well as the complexity, of claims asserted against professionals. The potential liability of attorneys, accountants, doctors, architects, and other "professionals" is a matter of great importance given the significant resources expended in providing professional services in the United States. This course will analyze the contours of liability principles in professional malpractice cases in the context of the legal, medical, and accounting professions. In addition, this course will study the interaction of malpractice cases with professional ethics and the theory of self-regulation. 3 units. *Staff*

**380. Research Methods in International, Foreign, and Comparative Law.** A survey of methods, techniques, and strategies for international, foreign, and comparative legal research, including the efficient use of LEXIS, WESTLAW, and the Internet. Examination of treaty law, the law of international organizations, European Union law, civil law and other foreign legal systems, and international litigation and business transactions. Students complete several research projects, including an annotated bibliography, on topics chosen in consultation with the instructor. Course required for students enrolled in the J.D./LL.M. in Comparative and International Law. Other students may be admitted by consent of instructor. 2 units. *Topulos*

**384. Securities Regulation.** A study of the federal and state securities laws and the industry they govern with emphasis on the regulation of the distribution process and trading in securities; subjects dealt with include the functions of the Securities and Exchange Commissions, registration and disclosure requirements and related civil liabilities, "blue-sky" laws, proxy solicitation and reporting requirements, broker-dealer regulation, the self-regulatory functions of the exchanges, and the regulation of investment companies. 3 units. *Cox*

**385. Securities Regulation II.** This class will focus on selected current issues in securities regulation and financial institution regulation. The selected issues will be explored in fact-specific settings from a client-oriented, hands-on perspective. One of the fact settings will involve a complete review of a major corporate transaction, such as an acquisition, recapitalization, or leveraged buyout. Emphasis will be placed on identifying the specific legal issues involved and evaluating the range of alternatives available to the client to achieve its business objective. Course work will include three or four memoranda of three to five pages each. Two of the memoranda will be done on a team basis, with each team consisting of two to three students. 3 units. *Staff*

**388. Social Science Evidence and Law.** Social science evidence has come to play an increasingly important role in civil and criminal cases at all levels of American courts. It is used, for example, in cases involving issues of trademark infringement, obscenity, discrimination, identification of criminal offenders, potential jury prejudice,

misleading advertising, eyewitness reliability, sexual assault, self defense, dangerousness, and the fashioning of remedies. The goal of this course is to teach law students to become sophisticated consumers and critics of social science evidence. 3 units. *Vidmar*

**390. Structuring Commercial and Financial Transactions.** In exciting and innovative areas of legal practice, companies have been raising money through structures intended to separate assets from risks associated with the company. Assets are then dedicated to repayment of capital market securities. "Structured finance" or "asset securitization" brings together fundamental legal disciplines, including bankruptcy, securities law, corporation law, secured transactions, finance, and tax. Topics include commercial financing techniques and concepts, guarantees, loan agreements, letters of credit, interest rate, and currency swaps; how capital markets work, rating agencies, cross-border and transnational considerations. Development and analysis of finance transactions. Consideration of ethics. 3 units. *Schwarcz*

**393. Trademark Law and Unfair Competition.** Current trademark and unfair competition law inspected from three different view points: theory, case law, and litigation strategy. If enrollment allows, practical drafting assignments will partially replace the final examination. Prerequisite: Law 270. 2 units. *Staff*

## CLINICAL COURSES

**400. AIDS Legal Assistance Project (Clinical Course).** An in-house legal clinic for persons with HIV/AIDS. Students will represent, under close supervision, persons with HIV/AIDS in document preparation (wills, living wills, health care powers, and powers of attorney); government benefits (medicaid, medicare, social security disability, foodstamps); permanency planning for children; insurance coverage; guardianship proceedings; employment and housing discrimination; other cases affecting the legal rights of persons with HIV disease. Each student will have an individual case load and will be required to spend one hundred hours on clinic cases. Prerequisite: Law 245, Law 301, may be taken concurrently. 4 units. *McAllaster and Wettach*

**405. Appellate Practice (Clinical Course).** Primarily taught by members of the federal judiciary. Covers the appellate process and the proper techniques involved in brief writing and oral advocacy. Each student is required to write an appellate brief with another student. In November, students may argue their briefs before members of the Moot Court Board before arguing for a grade before a visiting federal judge. Recommended for students who plan to participate in the Dean's Cup Moot Court Competition in the spring. The problem assigned will be the same one used in the competition second semester. Although the course is helpful for Dean's Cup, it is not a prerequisite for participating in the competition. Students who cannot take the course are eligible for Dean's Cup. 2 units. *Reppy and Sockwell*

**420. Civil/Criminal Trial Practice (Clinical Course).** An introduction to the civil and criminal litigation process and attendant skills. Emphasis on the interactions between attorneys and witnesses and between lawyers and juries by use of simulation and videotape pedagogy. Areas of inquiry include opening statements, closing arguments, direct- and cross-examination of lay and expert witnesses, objections, introduction of evidence, and trial preparation. Each student completes the course requirements by participating as counsel in a full jury trial. In the spring semester, instruction is concentrated in the first half of the semester. It begins with an intensive weekend of instruction in January. See the web for more information. Prerequisite: Law 245. 3 units. *Becton, Beskind, Sandra Johnson, Kuniholm, or T. Maher*

**423. Civil Pretrial and Trial Practice (Clinical Course).** This course uses simulated exercises to introduce the students to all aspects of the civil litigation process. The



instructors will serve in the role of senior partners and the students will act as associates in competing law firms to work through a civil case to develop skills in the areas of interviewing, fact investigation, case evaluation and strategy, preparation of pleadings, pretrial motions and conferences, jury selection, opening statements, introduction of evidence, direct and cross examination, trial motions, closing arguments, and posttrial motions. The course will end in a jury trial. Year-long course—total 6 units (3 units per semester). Prerequisite: Law 245. 3 units. *Glenn*

**430. Criminal Litigation (Clinical Course).** An examination of the lawyering process in criminal cases from the point of view of the criminal justice practitioner. Using videotape simulation, students will participate as attorneys in simulations of various stages of the criminal justice process from initial interview through trial, with special emphasis on pretrial proceedings. The clinical phase of the seminar requires each student to practice with criminal justice practitioners pursuant to the North Carolina Rules Governing Practical Training of Law Students. Placements include district attorneys, the public defender, and private defense counsel. Prerequisites: Law 226, 245, and 420. 4 units. *T. Maher and Rudolf*

**435. Death Penalty Clinic (Clinical Course).** Includes a seminar and a field component. The seminar examines doctrine governing selection of cases to be tried capital-ly and the imposition of the death penalty, concluding with a substantial research paper. The field work begins with skills training. Students are assigned to work with defense attorneys who are handling a defendant's conviction and death sentence. Students are not able to appear in court because of the charges and serious consequence at stake. Placements often involve analysis of trial transcripts, development of legal and factual issues, and traditional legal research. Students are required to complete one hundred hours of work with their placement. 5 units. *Adcock, Hill, and Mosteller*

**440. Estate Planning (Clinical Course).** An examination of the problems and techniques of estate planning and administration, including the income taxation of trusts and estates. Students prepare planning recommendations and draft related documents for hypothetical clients. Prerequisites: Law 255, 295, 326 (may be taken concurrently), and 340. 3 units. *Shaw*

**445. Forensic Psychiatry (Clinical Course).** This course is designed to provide the student with a working knowledge of the major areas of interface between psychiatry and law. Basic concepts of clinical psychiatry and psychopathology will be highlighted. Attorney and psychiatrist roles in the commitment process, right to treatment and right to refuse treatment, competency to stand trial, and criminal responsibility will be explored. Discussion of assigned readings, short lectures, interviews and observation of patients involved in legal proceedings, films, guest speakers, and field trips will form the basis of the course. 3 units. *Sally Johnson*

**448. International Development (Clinical Course).** This clinic is primarily concerned with assisting developing countries with legal research related to designing and implementing the framework legislation and regulation necessary for development. Where the courts make use of foreign and international law in interpreting constitutional and statutory law, the clinic will provide research support. Students and particular ministries of South Africa will have responsibility for legal issues facing the new nation as it seeks to promote development and overcome a history of inequitable legal arrangements and policies. Prerequisite: Law 277. 4 units. *Admay*

**460. Negotiation and Mediation (Clinical Course).** This course is designed to explore the processes of negotiation and mediation in legal and quasi-legal contexts.



Approximately 50 percent of the time will be devoted to theory about the social processes involved in the development of conflict and its resolution. The other half of the time will be devoted to case analysis, simulations, and related participation activities intended to give the student insights into styles and strategies of negotiation and mediation. 3 units. *Beason, Dimond, Ellis, or Vidmar*

**470. Poverty Law (Clinical Course).** Study of poverty, poverty programs, and the U.S. civil justice system. Topics include history of access to justice, demographics of poverty, a skills workshop on client-centered interviewing, food and income programs, health law, economic development, family law, employment, housing, and education. Students will interview a Legal Services client. Please see the law school web page for more information. 3 units. *Spruill*

## SEMINARS

Courses under this subheading that are listed as taught by *Staff* are unlikely to be offered during the 1998-99 academic year.

**503. Athletics and Antitrust (Seminar).** An examination of the economic structure of professional and college sports and the antitrust implications of centralized control through leagues and associations. Among the matters to be considered are the antitrust issues raised by rules controlling player movement, league control of franchise relocation, limitations on ownership rights, NCAA control of broadcast arrangements, and restrictive definitions of amateurism. Prerequisite: prior or concurrent enrollment in Law 285. 2 units. *Weistart*

**506. Black Legal Scholarship (Seminar).** The legal scholarship of black and other legal scholars on the relationship between race and the law. The influence of race on the interpretation and formation of law in constitutional and statutory settings. Examination of materials including cases, law review articles, books, and nonlegal material. Purpose: to permit participants to answer whether there can be a black perspective on the law, and what such a perspective has to say about substantive areas of the law including constitutional law, torts, property, and criminal law. Also, how black legal scholarship fits in with extensive feminist legal scholarship and other "parochial" concerns in this age. The concern that "black" is used to mean only black men, not black women. 2 units. *Staff*

**507. Chinese Company and Security Law (Seminar).** An intensive seminar on Chinese securities law. 1 unit. *Staff*

**508. Chinese Law and Society (Seminar).** Survey of Chinese legal thought and practice in the People's Republic of China. Focus on the relation of law to social ideals, to social change, and to politics. Consideration of socialist theories of law, conventional criminal and civil processes, informal and extrajudicial institutions, international law, and trade law. Prior familiarity with Chinese history or politics is unnecessary. 3 units. *Gao and Ocko*

**509. Chinese Legal History (Seminar).** A survey of Chinese legal history that focuses on late imperial law in the Qing dynasty (1644-1911). Attention given to the legal transformations in the twentieth century. Examination of the way in which a legal system creates and reflects a society's structures and values in a mutually interactive process that constructs a particular "legal sensibility." Readings drawn from Chinese codes, cases, and "detective novels" as well as, for comparative purposes, from European and American legal history. No previous background in Chinese history is required or expected. 3 units. *Staff*

**512. Comparative Public Law and Policy: Ethnic Group Relations (Seminar).** An

interdisciplinary seminar to appraise various approaches to the reduction of conflict in deeply-divided societies, primarily in Asia and Africa. Substantial attention will be paid to the nature of ethnic identity, the sources of group conflict, and the forms and patterns it takes. Consideration will be given to methods of analyzing social science materials and utilizing them for the design of policies, laws, and institutions. Approaches include federalism, regional autonomy, electoral law, parliamentary and presidential arrangements, programs to prefer under-represented ethnic groups in education, employment, other spheres of economic activity. Emphasis on forecasting and evaluating the impact of alternative approaches. 3 units. *Staff*

**513. Campaign and Election Law (Seminar).** Examination of the legal issues that arise during the course of local, state, and federal political campaigns and on election day, plus related areas. Subject matter areas addressed in the general order faced by, and from the perspective of, a typical campaign. Topics include precandidacy activities, campaign finance laws, Federal Elections Commission and state boards of election, regulation of paid political advertisements, defamation, interaction with other political interest groups (for example, parties, PACs, and independent expenditures), enfranchisement and registration, election day issues, challenging voting results, and redistricting. 2 units. *Staff*

**515A. The Congress: Government, Business, and Public Policy.** Study of evolving relations between business and government at all levels. Focus on United States Congress—decision making, effects from outside influences, changes in interaction. Application of principles to executive branch, regulatory agencies, state and local governments. Study of relationship between multinational corporations and nation states, changes in global economy. 3 units. *Kaufman*

**515B. The Congress (Seminar).** Examination of the Congress, concentrating on its operations in our constitutional system, influences of forces, and constraints on members. Examination of roles of constituents, interest groups, media, staff, leadership, and administration. Topics include campaign finance reform, congressional ethics, budget, role of committees, and processes of legislating, conducting oversight, and approving nominations and treaties. 3 units. *Kaufman and Schroeder*

**518. Constitutional Law II.** Federal constitutional law is at once a central and a highly controversial part of contemporary American law. The great expansion of issues subject to serious constitutional review by the courts, and the consequent profusion of judicial doctrines, necessarily mean that introductory courses in constitutional law omit or treat only fleetingly important areas and issues. This course will focus on a specific topic or doctrine in constitutional law, read extensively in the relevant case law, and examine the works of selected commentators. The topic addressed this semester is the law of the presidency: the president's independent constitutional authority and the office's relationship to Congress and the judiciary. 3 units. *Kinkopf*

**520. Theory of Constitutional Adjudication (Seminar).** Examination of the role of the Supreme Court and problems of method in deciding constitutional issues. Topics include uses of constitutional text, history and "original intent," structure, precedent, and moral or philosophical values. Coverage of mainstream and critical perspectives on constitutional theory—liberal, conservative, Critical Legal Studies, feminist, and Critical Race Theory. Seminar concludes with illustrative application of theoretical approaches to recent or current major cases or controversies. Prerequisite: Law 120. 2 units. *Rowe*

**522. Contemporary Jury (Seminar).** The jury plays a central role in American

criminal and civil law. Its effects extend beyond the cases that are tried before it because it sets the standards around which settlement negotiations occur. It is a controversial institution that has been vigorously defended by some and severely criticized by others who have labeled it incompetent, biased, capricious, and irresponsible. In this seminar we will explore the role and performance of the jury in modern American society. 2 units. *Staff*

**525. Corporate Restructuring (Seminar).** A case study approach to advanced bankruptcy issues raised by Chapter 9 and Chapter 11, using recent pleadings and decisions in cases involving Texaco, Insilco, Eastern Airlines, Orange County, Continental Airlines, VMS Properties, and DeLaurentis Entertainment. Prerequisite: Law 308 or consent of instructor. 2 units. *Coyne*

**526. Dispute Resolution.** One of the most significant recent developments in civil procedure is the evolution of alternative methods of resolving disputes. Under the general label of alternative dispute resolution (ADR), courts and private parties are increasingly using nontraditional methods to resolve disputes that previously were resolved through the traditional court process. Course materials will cover negotiation, arbitration, and mediation, as well as specific ADR techniques such as the mini-trial, court-annexed arbitration, and the summary jury trial. Special attention to empirical analysis of the impact of alternatives. 3 units. *McGovern*

**527. Employment Discrimination: Advanced Topics (Seminar).** Focus on the problems of complex employment discrimination litigation. Topics include psychological and behavioral aspects of discrimination, systemic discrimination, class actions involving pattern and practice claims, remedies, and settlements. Consideration of hostile work environment claims and the overlap between race and gender as a case study, using materials developed in actual cases. Exploration of mediation as a means of resolving employment discrimination claims prior to litigation. Prerequisite: Law 232. 2 units. *Staff*

**530. Entertainment Law (Seminar).** An introduction to selected theories, statutes, and regulations (other than intellectual property law) governing principal undertakings, business transactions, and legal relationships in the entertainment industry, including publishing, the theater, television and motion pictures, music, and related fields. Prerequisite: concurrent or prior enrollment in Law 270. 3 units. *Lange*

**533. Ethical Issues in Civil Litigation (Seminar).** This seminar will examine various ethical and professionalism issues relating to the conduct of civil litigation. It will include a detailed examination of those procedural rules and developments relating to the conduct of attorneys, most notably Rule 11. In addition, the seminar will investigate the origins of "zealous advocacy" and explore recent criticisms of that notion. Other specific topics will include (1) ethics and negotiation; (2) the lawyer's ethical duties to consider or use alternative dispute resolution; and (3) work-product and attorney-client issues in civil litigation. Enrollment limited to sixteen. 2 units. *Staff*

**537. Ethical Issues in Gratuitous Transfers and Taxation (Seminar).** An exploration of professional responsibility issues that arise in the representation of individuals and families in private, noncommercial relationships, including trusts and testamentary dispositions of property, as well as consideration of ethical issues in the attendant taxpractice. 2 units. *Staff*

**538. Ethical Issues for Lawyers in Corporate Law and Practice (Seminar).** This course examines a range of ethical issues for lawyers in transactions and litigation involving corporate parties. In particular, the course examines ethical issues incident



to negotiating and advising in transactional contexts, to litigation brought on behalf of a corporation's shareholders or derivatively on behalf of the entity itself, and to dimensions of relationships between a corporate client and its inside and outside counsel. Prerequisite: Law 210, which may be taken concurrently. 2 units. *Staff*

**541. Exempt Organizations (Seminar).** Consideration of state and federal regulation of nonprofit entities, with attention to organization of such entities under state law. Qualification for exemption from taxes will be examined, along with the applicability of special taxes that other organizations are subject to, including taxes on prohibited self dealing, failure to meet minimum distribution requirements, and conduct of a business unrelated to the exempt purpose of the organization. Examination of limitations on deductions for charitable contributions, and the state and federal regulation of fund-raising and lobbying activities of exempt entities. 2 units. *Staff*

**543. Federal Practice of Civil Rights and Civil Liberties (Seminar).** A study of advanced constitutional law and federal practice, working through a series of problems to provide: (a) familiarity with the principal federal statutes (procedural, substantive, and remedial) used in civil rights litigation; (b) their judicial interpretation and application; and (c) a consideration of frontier constitutional issues. 3 units. *Van Alstyne*

**546. Advanced Constitutional Law (Seminar).** Focus on October 1996 Supreme Court Term. Cases include Physician Assisted Suicide Cases, *Clinton v. Jones*, the Brady Act Cases, Line Item Veto Cases, Religious Freedom Restoration Act decision. Focus will then turn to the October 1997 Term. Cases include *Piscataway School District v. Taxman*, *Arkansas Public Television v. Forbes*. 2 units. *W. Dellinger*

**548S. Development of United States Courts of the Fourth Circuit (Seminar).** Examines judges, courts, and law of United States district and old circuit courts and Court of Appeals: Maryland, Virginia, West Virginia, North Carolina, South Carolina, 1789-1958. Consent of instructor required. C-L: History 255A and Political Science 238S. 3 units. *P. Fish*

**549. Governance, Responsibility, and Crime in the Public Corporation (Seminar).** This seminar will examine three related but distant themes common to discussing the misbehavior of the public corporation. Misbehavior is defined broadly to include poor financial performance, the manufacture of unsafe products, the pollution of the environment, and criminal misconduct. The first theme is how the current structure of the corporation contributes to its malfunctioning. To this end, we will examine the experiences of other countries that have different ownership structures. The second theme is how we define responsible behavior and the costs and benefits of asking corporations to be responsible citizens. The final theme is the mechanisms within the criminal justice system for imposing misconduct of others. 2 units. *Cox*

**550. Health Care: Emerging Issues (Seminar).** Although there are no prerequisites, this seminar may be taken either as an extension of Health Care Law and Policy (347) or for advanced study in antitrust law. Topics to be addressed include the legal accountability and regulation of managed care organizations (including ERISA issues); quality assurance; private contracts as instruments of health care reform; provider networks and related antitrust issues; conversion of nonprofit hospitals to for-profit status; and hospital mergers. 2 units. *Staff*

**552. The Public Profession of the Law (Seminar).** Conducted as a collective individual study. Students evaluate the public ethics of lawyers involved in the event, including scrutiny of the social and political context in which particular acts occur.



Paper topics, chosen with instructor approval, will be events in the history of the United States in which law and lawyers were prominently involved. 3 units. *Staff*

**554. International Criminal Law (Seminar).** Examination of the law of crimes criminalized by international treaty or custom, including war crimes, genocide, crimes against humanity, piracy, slave trade, certain forms of terrorism. Study of historical background since World War I, current developments including proceedings of the International Crime Tribunals for the former Yugoslavia and Rwanda, future prospects including apparently imminent establishment of a permanent International Criminal Court. Also includes topics of intergovernmental cooperation in criminal matters (extradition, collection of evidence) relevant to the enforcement of criminal law. 2 units. *Morris*

**555. International Environmental Law (Seminar).** Mechanisms, institutions, rules relating to regional and global environmental issues. Responsibility and liability in international law for environmental damage; marine pollution, and the role of the International Maritime Organization; regulation of transboundary atmospheric pollution, ozone-depleting gases, cross-border movement, disposal of hazardous wastes; regulation of nuclear activity and the role of the International Atomic Energy Agency; special environmental regimes; conservation of endangered species and areas through CITES, the World Heritage convention, other treaties; deforestation and biodiversity; the role of UNEP, regional, bilateral bodies; regulation of greenhouse gas emissions. 2 units. *Admay*

**557. International Law and International Relations (Seminar).** Fundamental topics about the nature of international law and its roles in international relations. Recent work by lawyers and specialists is assessed and applied to analysis of major practical problems in international law. Issues include: authority and justification in international law; claims to coherence in the discourse of international law; explanations of cooperation among states, and its limits; relations between municipal, transnational, and international levels of law; the place of law in the formation, maintenance, change, and termination of international regimes and institutions; means for measuring and evaluating compliance or noncompliance; and problems in the international legal system. Prerequisite: Law 275 or 354. 2 units. *Staff*

**558. International Sports Law (Seminar).** Coverage of issues regarding governing bodies and individual athletes. Topics include: International Olympic Committee, structures not operating under the Olympic umbrella; link between Olympic and non-Olympic sports; sources of revenue; dispute resolution; individual athlete eligibility issues, drug use and testing; contractual opportunities; the role of politics in international sports. Please see the web for more information. 2 units. *D. L. Coleman*

**560. Israeli Law (Seminar).** A study of various areas of Israeli law in a comparative perspective to the common and civil law. Examination of the Israeli legal system starting from Ottoman and British regimes to establishment of the state of Israel. Detailed examination of Israel's public law (government structure and human rights within constitutional and administrative law). Exploration of Israel's commercial and corporate law including contract, tort, corporate, securities, property, and tax law. 2 units. *Staff*

**563. Jewish Law (Seminar).** Study of factors (cultural and juristic) in the development of Jewish law, especially in the Talmudic and medieval periods; relationship between "religious" and "civil" law; the legal codes and the decision-making process of the rabbinic courts. Some legal texts (in translation) will be submitted to intensive examination. 2 units. *Golding*

**566. Judicial Responsibility (Seminar).** This seminar will examine a number of topics relating to the judicial role in dispute resolution. Topics will include (1) the judge's duty of recusal; (2) judicial first amendment rights to comment on pending cases or to participate in political activity; (3) judicial obligation and authority to control the legal profession; (4) ethical issues raised by active judicial management; (5) ethical duties in judicial decision making; and (6) the propriety of judicial involvement in the settlement process. 2 units. *Staff*

**568. Justice, Law, and Commerce in Islam.** Islamic approaches to the legal and ethical regulation of social life. C-L: African and African-American Studies 254 and Religion 254. 3 units. *Staff*

**572. Law and Development: Markets, Democracy, and Ethnicity in the Developing World (Seminar).** This seminar will critically survey the legal work being done by practitioners and academics in Latin America, Southeast Asia, and the former Soviet Union. Final paper instead of examination. 2 units. *Staff*

**574. Legal Intervention in Domestic Violence (Seminar).** Three interdisciplinary elements of legal intervention in domestic violence: (1) the psychology of battering; (2) the social science research that has evaluated the effectiveness of domestic violence interventions; and (3) theory and critique of these legal interventions. Topics include: the dynamics of domestic violence, why men abuse, and the coping processes of battered women; studies of police arrest, prosecution, and restraining orders; and discussion of a wide range of criminal and civil remedies/policies such as mandatory arrest, no-drop prosecution, divorce and child custody, reformed restraining order laws, court-ordered treatment for batterers, and self-defense for battered women who kill their abusers. C-L: Psychology 309. 2 units. *Fischer*

**575. Legal Writing: Advanced (Seminar).** Intensive practice in various modes of legal writing, using workshop-style critiquing of drafts, peer review, and computerized aids as well as feedback from the instructor. Critiques will be on all aspects of writing, including style, substance, and structure. 2 units. *Staff*

**577. Normative Dimensions of International Trade.** Examination of normative dimensions underlying trade and development policies. 1: Exploration of traditional assumptions underpinning trade policy that are altered and whether they are outmoded. Examination of historical global divisions of labor and how they are transformed by new global order. 2: Examination of connection between trade and development, both internationally and economically impoverished areas. 3: Study of the connection between culture and economics. How exchanges are organized, regulated, and governed. 2 units. *Cao*

**578. Liberalism, Religion, and the Law (Seminar).** Includes readings of basic texts on the history of liberal thought (Hobbes, Locke, Kant, Mill, Rawls). Consideration of the religion clause of the first amendment in the context of the recent writings by people like Steve Smith, Kent Grunewald, Michale McConnell, Steve Carter, and others. 3 units. *Staff*

**579. Mass Torts in Manifold Perspective (Seminar).** An integrated and in-depth look at combination of issues raised by complex mass tort lawsuits; substantive tort law; civil procedure; litigation strategy; lawyer-client relationships; economics of settlement, ethics, judicial role, societal impacts. Exploration of eight to ten celebrated mass tort lawsuits such as Buffalo Creek disaster, asbestos, Dalkon Shield, Agent Orange, Woburn leukemia case, tobacco smoking, silicon breast implants, electromagnetic fields, medical malpractice. Readings will emphasize historical accounts that put

litigation in context, as well as judicial opinions and scholarly commentary. 2 units. *Staff*

**580. Medical/Legal/Ethical Issues (Seminar).** A seminar composed of students and faculty from the Medical, Law, and Divinity Schools that will critically consider selected pertinent issues of mutual professional interest. Students organized in cross-disciplinary teams make presentations on these issues, on which they also prepare detailed analytical outlines and extensive bibliographies. 2 units. *Shimm et al.*

**581. Psychology of Litigation (Seminar).** The litigation process inherently involves psychological perceptions and evaluations. What causes people to pursue legal rights in the first place? Why does settlement of disputes occur? What causes litigants to prefer different types of resolution forums? How do jurors respond to witnesses and other types of evidence? The seminar addresses these and other questions by reference to empirical social science literature. 3 units. *Staff*

**582. National Security (Seminar).** A study of the separation of powers in national security matters; presidential war powers; the War Powers Resolution; the role of the judiciary in national security matters; congressional and presidential emergency powers; operational Law and the Law of War; internal and personnel security; the Freedom of Information and Privacy Acts; access to national security information in the federal courts; and restraints on disclosing and publishing national security information. See the web for more information. 3 units. *Everett and Silliman*

**583. Philosophy of Law (Seminar).** This seminar introduces students to philosophical thinking about law through a selective study of some of the main concepts that structure legal analysis in two substantive areas of the law: tort and crime. Our overall concern will be with the nature of liability for tortious injury and criminal wrongdoing: How is liability in these two areas to be justified? Does either form of liability express a coherent notion of responsibility or fairness? Or are these forms of liability perhaps better understood as instruments for achieving social utility or welfare? Are these exclusive options? Readings focus on such concepts as intention and motive, negligence, strict liability, causation, insanity and other excuses, punishment, and nuisance. 2 units. *Staff*

**584. Political Philosophy and Law (Seminar).** Examination of theories of community in classical and contemporary philosophical sources. Also, readings in some anthropologists and sociologists as well as legal theorists (principally Lon Fuller). Special attention paid to the relationship between theories of community and theories of rights and to the role of rights discourse in various kinds of dispute-settlement processes. Short weekly reports and a term paper will be required. 3 units. *Staff*

**585S. Philanthropy, Voluntarism, and Not-for-Profit Management (Seminar).** An examination of the role and functioning of the not-for-profit sector in relation to both the public sector and the private for-profit sector in dealing with significant social problems. C-L: Public Policy Studies 280S. 3 units. *Fleishman*

**586. Property: Advanced Topics (Seminar).** Examination of the concept of property, its place in liberal democratic theory, its usefulness in resolving current social conflict issues. The concept of rights. The particular right of property and the extent it should be placed beyond the democratic process. Property concepts used in resolving issues such as freedom, organ transplants, economic rights. First Amendment freedoms. 2 units. *Underkuffler*

**587. Race and the Law (Seminar).** Are we a colorblind society? Is English-only the way to go? Is there a model minority? Are Native American children better off with Na-



tive American parents? Should affirmative action be abolished? Are all women white and all blacks men? Was *Brown* right? Exploration of historical and contemporary treatment of race by courts and legislature. Examination of social and political forces that contribute to development of legal doctrine of education, employment, health care, interracial sex and marriage, public accommodations. Exploration of the definition of race, intersection of race and gender, interplay of race and class, juxtaposition of various ethnic groups, utility of biracial dichotomy in multiracial society. 2 units. *Staff*

**588. Responsibility in Law and Morals (Seminar).** Investigation of the relationship between responsibility in the law and moral blameworthiness; excuses and defenses; the roles of such concepts as act, intention, motive, ignorance, and causation. Texts: Holmes, *The Common Law*; Hart, *Punishment and Responsibility*; Morris, *Freedom and Responsibility*. 3 units. *Staff*

**590. Risk Regulation (Seminar).** Pursues an integrated analysis of society's efforts to deal with risks of harm to humans and other life. Study of the science, economics, and policy of risk leading to an examination of specific reforms of the laws and institutions of risk assessment and risk management that are currently being debated in the Congress. Prerequisite: Law 235 or consent of instructor. 2 units. *Staff*

**592. Telecommunications Law (Seminar).** This seminar explores contemporary issues in international telecommunications regulation, especially in the United States; emphasis will be on the future: the information highway; new technologies; and new legislative and market strategies in America and elsewhere in the world. Frequent guest lecturers. Prerequisite: Law 270. 3 units. *Lange*

**593. Sexuality and the Law (Seminar).** This is a course about how sexuality affects the structure and enforcement of legal rules and regimes, and how sexual orientation influences the application of legal rules to individuals in our society. Much of this course will center around discussions of gay, lesbian, and bisexuality, but the course will end with a section on heterosexuality. 2 units. *Staff*

## INDEPENDENT STUDIES AND TUTORIALS

**605. Chinese for Legal Studies.** An introduction to the terminology and basic concepts of Chinese law. Reading and analysis of legal texts (codes, cases, contracts, wills). Communication about law and law-related issues in Chinese. Prerequisites: three semesters or equivalent of Chinese and consent of instructor. 2 units. *Jiang*

**610. Exchange Program.** Credit/no credit. 14 units. *Staff*

**620. Externship in International Law.** Credit/no credit. 14 units. *Staff*

**630. French for Legal Studies.** An introduction to the terminology and basic concepts of French law. Reading and analysis of legal texts (codes, cases, contracts, wills). Communication about law and law-related issues in French. Prerequisites: three semesters or equivalent of French and consent of instructor. 2 units. *Mirandes*

**635. German for Legal Studies.** An introduction to the terminology and basic concepts of German law. Reading and analysis of legal texts (codes, cases, contracts, wills). Communication about law and law-related issues in German. Prerequisites: three semesters or equivalent of German and consent of instructors. 2 units. *Staff*

**640. Independent Research.** Law students in their second and third year of the J.D. or LL.B. programs may undertake up to four semester hours of independent research in any academic year if the research is approved by a faculty member. Research will be graded on a credit/fail basis. Students undertaking independent research will meet regularly with the faculty member supervising the research in order



to ensure contemporaneous discussion, review, and evaluation of the research experience. Variable credit. *Staff*

**650. Japanese for Legal Studies.** An introduction to the terminology and basic concepts of Japanese law. Reading and analysis of legal texts (codes, cases, contracts, wills). Communication about law and law-related issues in Japanese. Prerequisites: three semesters or equivalent of Japanese and consent of instructor. 2 units. *Inagawa*

**653. Legal and Business Russian.** Introduction to Russian language and culture in the area of legal studies and conducting business in or with Russia and other Commonwealth of Independent States countries. Primary materials include contracts, advertising, and financial documents. Prerequisites: Russian 1 and 2 or consent of instructor. 3 units. *Staff*

**655. Spanish for Legal Studies.** An introduction to the terminology and basic concepts of Spanish law. Reading and analysis of legal texts (codes, cases, contracts, wills). Communication about law and law-related issues in Spanish. Prerequisites: three semesters or equivalent of Spanish and consent of instructor. 2 units. *Posadas*

## SUMMER COURSES

Courses under this subheading that are listed as taught by *Staff* are unlikely to be offered during the 1998-99 academic year.

Courses with suffix G are taught in Geneva.

**206G. Corporate Governance.** A comparative examination of relationships among shareholders, directors, employees, and creditors. A brief introduction to relevant concepts in corporate law. Focus on current developments and disputes affecting corporate governance. Examination of a variety of institutional models and legal doctrines that define relationships among varied stockholders. 2 units. *Staff*

**207G. Comparative Intellectual Property.** An introduction to basic intellectual property doctrines from multiple national and international perspectives. Focus on key intellectual regimes of copyright, patents, and trademarks, using legislation and cases from a number of countries. Emphasis on registration of trademarks and service marks, on the patentability of biotechnological inventions and computer programs, and on some copyright related topics. 2 units. *Staff*

**212G. Compared Constitutional Systems.** Exploration of Swiss and European constitutional framework and history, organization and separation of powers, basic structures and institutions of federalism, system of human rights protection within both constitutional areas. Focus on constitutional developments in Canada and South Africa; Canadian models of constitution-making and interpretations and the influence in South Africa. 2 units. *Auer and Bauman*

**219G International Tax.** An introduction to international taxation of business transactions. The principle rules of the U.S. taxation system relating to international business will be reviewed, including the interaction of U.S. rules with taxation systems in European countries. 2 units. *Oberson and Schmalbeck*

**222G. International Trade.** Introduction to the principles and standards of international economic law; elementary consideration of trade theory and policy. Concentration on formal mechanisms employed by governments to resolve international trade and investment disputes with other governments. 2 units. *Davey and Weiss*

**225G. International Criminal Law.** Study of ways in which states cooperate in the fight against international business crimes such as fraud, money laundering, insider trading, or corruption. Focus on enforcement of international crime law, including

criminal provisions in international humanitarian law and human rights law. 2 units. *Cassani, Harari, and Morris*

**226G. International Dispute Resolution.** Study of three different methods of settlement of international business disputes: litigation, arbitration, and mediation. Concentration on formal mechanisms employed to resolve disputes with other governments. Emphasis on procedure governing the settlement of international trade disputes under the Agreement Establishing the World Trade Organization. 2 units. *Staff*

**230G. International Organizations.** Study of the activities of international organizations and their features, including constitution, membership and functioning, normative action taken, and enforced action. An examination of humanitarian law and human rights in the Security Council of the United Nations. An introduction to South Africa's new constitution and areas in which the drafting process was directly guided by international standards. 2 units. *Staff*

**273G. Transnational Environmental Law.** Focus on international aspects of environmental law, influence of international law on national legislation, conflicts which might arise between national concern and international conventions. Focus on the role of international organizations in the evolution of environmental law. Overview of environment-related institutions in the UN system, regional structures, and bilateral transboundary arrangements. 2 units. *Petitpierre-Sauvain and Sand*

**290G. Introduction to American Law.** Examination of major elements of American law which pertain to civil practice, designed to acquaint students with traditional core of private law defining individual relations and business enterprises: contracts, corporate law and business associations, property and torts. An overview of American legal system and how it came into being. A view of the legal status of American colonies immediately prior to the American Revolution. Examination of the changes necessitated by the Revolution, including sovereignty and reception of common law in postcolonial United States. For non-U.S. students only. 2 units. *Metzloff and Reppy*

Courses with suffix H are taught in Hong Kong.

**201H. Business Law and Organization.** A concise comparative introduction to business law in Korea and Japan. A survey of main commercial subjects in each country. Focus on chaebol in Korea and keiretsu in Japan. First term will cover corporate and securities laws in Korea. Second term will explain basics of Japanese business law to lawyers from common law countries. 2 units. *Kashiwagi and Kim*

**203H. Chinese Commercial Law and Foreign Investment.** Examination of overall structure of Chinese legal institutions and commercial law, and legal issues connected with investment in China. Special attention will be paid to the operation of the legal system. First term provides a general introduction to business law in China. Second term will introduce foreign investment laws in China, providing insight into how the Chinese legal regime is developing to cope with economic system changes. 2 units. *Conner and Lam*

**206H. Corporate Governance.** Examination of the management of corporate affairs, treatment of minority shareholders by those in control of corporate affairs, and legal remedies available to shareholders. Exploration of the relationship between the board of directors and the general shareholders. Focus on the legal positions and comparisons in other jurisdictions. 2 units. *Boros and Goo*

**207H. Comparative Intellectual Property.** An introduction to basic intellectual property doctrines from multiple national and international perspectives. The focus of

the instruction will deal with computer program and data protection as well as certain issues arising from the development of a global information highway. 2 units. *Staff*

**208H. Constitutional Transitions.** Examination of the process of the resumption of sovereignty over Hong Kong by China and the new constitutional order in Hong Kong. Particular attention to differing traditions of legality and the coexistence of different economic, political, and legal systems within one state. Contemporary constitutional change and implementation of bills-of-rights regimes. Attention to the Canadian Charter of Rights and Freedoms and the South African Bill of Rights. 2 units. *Staff*

**209H. International Business Transactions.** Focus on business in the People's Republic of China. Examination of vehicles for conducting trade in the PRC. Examination of tensions in several areas of international trade. Emphasis on problems posed by U.S. trade policies from a Hong Kong perspective. Special attention to U.S. regulation of textile imports and anti-dumping laws. 2 units. *Staff*

**217H. International Commercial Disputes.** Exploration of legal issues involved in mediation and arbitration of commercial disputes. An introduction to negotiation, mediation and arbitration, and other methods used in resolving commercial disputes. Examination of interactional commercial arbitration; illustration of actual cases using arbitration as a method of dispute settlement. Focus on negotiation, developing general negotiation principles and skills. Simulated negotiation exercises. 2 units. *Lynch and Vidmar*

**228H. Comparative and Transnational Insolvency.** An introduction to insolvency law, with an emphasis on United States and Hong Kong, including both the bankruptcy of individuals and the liquidation of companies. 2 units. *Staff*

**237H. International Human Rights.** An examination of the system of public international law as it relates to human rights. Topics include: criminal and civil responsibility for war atrocities and genocide, the law concerning equality and discrimination, and the status of women, aliens, refugees, and other particular groups. The course focuses on controversies in which universal international standards may be in tension with national or regional cultures and legal systems. 2 units. *Staff*

**240H. The Law of Currencies and Development.** Focus on global and regional institutional settings. The global institution is the International Monetary Fund created after the Second World War. Regional arrangements are characterized by attempts to reduce the range of currency fluctuation by introducing a single currency. Study of Asian Development Bank, legal problems and perspectives of governments interacting with the International Monetary Fund and Asian Development Bank. 2 units. *Bernstein*

**248H. Legal Aspects of Trading.** Focus on resolving various legal problems facing international foreign enterprises in transactions with Korean counterparts. Subjects include antitrust, import regulations, laws on foreign investment, intellectual property laws. Introduction of India's legal framework and judiciary. Study of new liberalized rules governing foreign investment as laid down in India's New Industrial Policy of 1991. Focus on basic features of Indian law in areas of company law, taxation, employment law, environmental law, intellectual property, and arbitration. 2 units. *Staff*

**272H. Securitization and Capital Markets.** Explanation of why businesses look to capital markets rather than bank loans for financing. Introduction of fastest growing capital market innovation, securitization, and structured finance. Exploration of fundamental international principles of securitization that derive from commercial finance, bankruptcy, and tax. Also, how capital markets work both in the United States and abroad, illustrating the role of agencies and application of derivative products

such as currency swaps. 2 units. *Staff*

**275H. Transnational Securities Law.** Topics include an overview of U.S. securities laws, regulatory challenges of internationalized securities markets, international public offerings, offshore offerings, extraterritorial application of U.S. securities laws. Emphasis on securities of Hong Kong, attention to securities laws of the PRC and a sample of Southeast Asian countries. 2 units. *Staff*

**290H. Introduction to American Law.** An examination of the institutional context, legal terminology, and basic legal research techniques necessary for understanding and using American law. An introduction to foundational legal principles that govern core areas of private law as well as an examination of the major elements of American law that pertain to civil practice. For non-U.S. students only. 2 units. *Danner and Rowe*



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## *Degree Programs*



## The First Professional Degree in Law

**Juris Doctor.** Upon favorable recommendation of the faculty, the degree of Doctor of Law (J.D.) will be conferred upon students who have successfully completed the following requirements:

1. six semesters in residence at Duke, during a minimum of eighty-four weeks of class; and
2. a passing grade in courses aggregating eighty-four semester-hours; and
3. a grade-point average of at least 2.1 and status in good standing under the rules of the Law School.

Three hours of credit toward the J.D. degree (six with special permission of the Administrative Committee), may be earned in courses taken at Duke outside the Law School in the Graduate School, in upper-level undergraduate courses, or in courses in foreign languages.

Two semesters of law study undertaken at another accredited American law school may be counted toward the required total if the final two semesters (exclusive of a summer session) and at least fifty-four semester hours of law study are completed at Duke, except as specifically authorized by the law faculty.

**Bachelor of Law Degree.** Upon favorable recommendation of the faculty, the degree of Bachelor of Law (LL.B.) will be conferred upon students who have satisfied all of the requirements listed above as necessary for the Doctor of Law degree but who do not possess a baccalaureate degree before completing the program of study for the Doctor of Law degree.

## Joint Degrees for Enrichment: Summer-Entering Programs

**Master of Arts for Law Students.** The School of Law and the Graduate School of Duke University jointly sponsor a program of study in law and several alternative disciplines, including cultural anthropology, economics, English, environmental studies, history, mechanical engineering, philosophy, political science, psychology, public policy science, Romance studies, and an interdisciplinary program in the humanities. The purpose of the program is to encourage the broader intellectual interests of law students and to foster dialogue between law and related disciplines. Upon satisfactory completion of the required course of study, candidates will be awarded both the M.A. or M.S. and J.D. degrees.

Students enter the joint J.D./M.A. (or J.D./M.S.) program in the summer before the first year of law school, undertaking part of the first-year law curriculum. Throughout their remaining six semesters in residence, students will combine their legal studies with courses selected from the Graduate School curriculum, generally taking one or

two Graduate School courses per semester during the first year and five more in the final four semesters, for a total of eight Graduate School courses.

**Master of Laws (International and Comparative Law).** Since 1985, the Law School has offered the opportunity to selected J.D. candidates to pursue a Master of Laws degree emphasizing international and comparative law study contemporaneously with their study for the J.D. degree. Students accepted to this joint degree program will enter in the summer, undertaking part of the regular first-year curriculum with students who are enrolled in the joint J.D./M.A. summer program. During the remaining six semesters of law study and in a four-week period of summer study at Duke's Summer Institute in Transnational Law at the University of Geneva in Switzerland, or the Asia-America Institute in Transnational Law in Hong Kong, or in another approved program, J.D./LL.M. students will complete requirements for both degrees. Candidates for the LL.M. degree will be required to complete twenty credit hours of approved courses, which must include international law (public), comparative law, research methodology in international, foreign, and comparative law, and coursework or an independent study for which a significant piece of writing is required. Candidates must obtain a minimum grade point average of 2.5 in these courses. Students must also show competency in at least one foreign language. Six of the twenty hours required for the LL.M. may be taken in the Graduate School or in upper-level undergraduate coursework, including advanced language study. Beyond the required courses, the courses applied toward the LL.M. consist primarily of those in international, comparative, and foreign law at the Law School and at one of the Institutes in Transnational Law but may also include courses taken in related fields in other divisions of the university. The area studies program at Duke is particularly rich in courses dealing with Canada, China, Germany, and Japan.

## Accelerated J.D. Program

Since 1990, the Law School has offered a program under which students may earn a J.D. degree in less than three years. Participants begin Law School during the summer before the first year, attending classes with joint degree candidates. During a later summer they must attend classes at another ABA/AALS-accredited law school. While not for everyone, this program will enable participants to reduce by about six months the time required to obtain a J.D. degree, which may have the effect of lowering the effective cost of a legal education. At the time of their application for admission, interested students must designate that they are applying for this accelerated program.

## Advanced Professional Degrees in Law

The Law School program is primarily designed to serve students seeking a first professional degree in American law. Except for international students and participants in the J.D./LL.M. program described above, students are rarely admitted for the purpose of continuing the study of law at the master's or doctoral levels, although the faculty is empowered to authorize such admissions. Applications for such study by American graduates of American law schools are not sought. International students should consult the chapter of this bulletin addressed to them.

**Master of Laws (LL.M.).** Most international students seek the master's degree, having already been trained in the law of their own countries. To qualify for this degree, the student must successfully complete two semesters of study in residence, and no fewer than twenty-one semester hours with a cumulative grade point average of 2.5. Included in the twenty-one credits of work must be at least two credits of individual written work to be completed either in a seminar or in an independent study course supervised by a faculty member. Many students also take a first-year course. Most foreign students will be expected to enroll in Introduction to American Law, which

provides an overview of several areas of the American legal system and also a two-credit legal writing course, which offers instruction and practice in the kinds of written tasks facing American law practitioners.

The remainder of the academic program is individually selected by the student from the curriculum offerings for first-year and upperclass students. International students attend classes with American students and are graded on the same basis. The degree is granted to students who achieve a grade point average of 2.5. Candidates ordinarily are expected to complete the LL.M. degree in one year.

**Doctor of Juridical Science (S.J.D.).** Outstanding international students who have earned a degree at the master's level from Duke or a law school of recognized standing, and who have a serious academic interest in law, may be admitted as provisional candidates for the S.J.D. degree. Only international students who have achieved superior academic performance during the master's degree program as well as at their home institutions should apply to the S.J.D. program. Samples of written work, such as completed seminar papers, and a statement of research intentions, should be included with the application. Candidates will usually be asked to complete one or two additional semesters of coursework with a grade point average of at least 3.1, and must pass an examination to test mastery of their chosen field, before being admitted from provisional candidacy to candidacy. The program will ordinarily take from one to three years to complete, depending on the time necessary for research and the production of the doctoral dissertation. It is expected that S.J.D. candidates will conduct original research and make a significant and original contribution to legal scholarship. A committee of the primary faculty supervisor and two additional faculty members will approve a candidate's dissertation proposal, assess the progress of the candidate and the research product, and conduct an oral examination upon the candidate's dissertation. Generally, only one or two students gain admission to this program of study each year.

## Other Professional Degrees for Lawyers

Advanced degrees may be pursued together with the J.D. degree. Under any approved joint-degree programs, including those described below and those approved on a case-by-case basis by individual application, the Law School recognizes twelve credits from the other degree program toward the J.D. requirements, as long as both are completed simultaneously.

**Master of Business Administration.** The School of Law and Duke's Fuqua School of Business have established a combined program of study in law and graduate-level business administration. The program provides the opportunity to acquire an education in both law and business administration in four years. Upon satisfactory completion of the required course of study, candidates will be awarded both the M.B.A. and the J.D. degrees.

The student in the M.B.A.-J.D. program may enroll the first year in either the Fuqua School of Business or the School of Law. If the student begins in the Law School, the first-year curriculum is the same as that of other law students; if the student begins in the business school, the first-year curriculum is the same as that of other graduate business students. The student's second year consists of the full first-year program of the other school. In the third and fourth years of the program, the student takes courses in both schools, with about two-thirds of the courses taken in the Law School. Students interested in the health care industry may elect to concentrate their work in the Fuqua School in health administration.

**Master of Environmental Management.** The School of Law and Duke's Nicholas School of the Environment have established a combined four-year program of studies in law and graduate-level environmental management. The program gives students the opportunity to acquire knowledge about natural resources and environmental science



which is critical in identifying and resolving legal issues with implications for the environment. Upon successful completion of the program, candidates receive both the M.E.M. and J.D. degrees. Students in the J.D./M.E.M. program typically spend the first full year in the Law School and the following year in the Nicholas School. During the remaining two years, candidates can structure an elective program of combined study that meets the requirements of both programs. Students are required to complete 36 credits and a master's project in the Nicholas School. The J.D. degree requires 84 units of credit, 12 of which may be satisfied through work in the Nicholas School.

**Master of Public Policy.** The School of Law and Duke's Sanford Institute of Public Policy have established a combined four-year program of studies in law and graduate-level policy sciences. The program provides an opportunity for students to acquire decision-making skills and substantive policy knowledge that would be useful in dealing with problems of the public sector. Upon satisfactory completion of the required course of study, candidates will be awarded both the M.P.P. and the J.D. degrees. The combined program requires completion of seven or eight academic semesters and one summer internship. The first year is spent exclusively in the Law School; the second year exclusively in the Institute of Public Policy; and the third and fourth years primarily in the Law School with some coursework in the Sanford Institute. In addition, the student must select a substantive policy area in which to concentrate from among the fields of the administration of justice, communications policy, health policy, and education policy; a summer internship and thesis will be required in the chosen field.

**Master of Theological Studies.** Students in the joint J.D./M.T.S. program are required to complete a minimum of seventy-two hours in the Law School and a minimum of twelve courses in the Divinity School, and to take all courses required for the two degrees. Persons interested in this joint program must apply separately for admission to each school. Generally students apply simultaneously to both schools. Later applications will be considered, but must be made before the end of a student's first year in either the Law School or the Divinity School.

**Doctor of Medicine.** The School of Law and the Duke University School of Medicine jointly sponsor a program of combined legal and medical education. The program provides an opportunity to acquire a full basic education in the two fields in six years. Upon satisfactory completion of the required course of study, candidates will be awarded both the J.D. and M.D. degrees.

The student in the M.D.-J.D. program begins the six-year course of study in the School of Medicine. As in the regular M.D. program, the first year is devoted to the basic medical sciences, and the second year to the basic clinical disciplines. After those two years, the student enrolls in the Law School, taking the prescribed first-year courses. A total of seventy-two credits must be earned in the Law School. As electives, the student may select Law School courses that pertain to medical-legal interests. After completing all law requirements, the student returns to the Medical School for elective clinical work tailored to the student's specialized needs. In addition, eighteen semester-hours, or two summer sessions, of elective basic science work are required.

**Ph.D. in Political Science.** The Law School and the Department of Political Science offer a joint degree program combining a J.D. and a Ph.D. in political science. The coordinated course of study permits some reduction in the required course work for each degree. The program is intended to integrate in a comprehensive, rigorous manner the subject matter and methodology of both disciplines. Study may be undertaken in areas such as American government, political theory, comparative government, and international relations.

The joint program is extremely selective and demanding, requiring about seven years to complete. Only students strongly committed to careers for which holding professional degrees in both disciplines is very important should apply. Graduates of the joint program would be well-positioned to conduct research and to teach either in

law schools or departments of political science or to pursue careers in government, international institutions, or the private sector.

Similar joint J.D./Ph.D. programs may be created with one or more additional departments in the future. Meanwhile, some joint programs can be arranged on an ad hoc basis.

## The Secondary Degree in Law

### MASTER OF LEGAL STUDIES

Upon favorable recommendation of the faculty, the degree of Master of Legal Studies (M.L.S.) will be conferred upon students who have successfully completed a one-year program of study in the Law School. Students specifically admitted to candidacy for this degree will pursue an individually designed curriculum including both first-year and upperclass courses. In exceptional cases, the degree may also be awarded to J.D. candidates who meet its requirements and who decide not to continue the study of law.

Students will be deemed successfully to have completed a one-year program of study in the Law School if, during a minimum of twenty-eight academic weeks, they have satisfied the following requirements:

1. a passing grade in Law School courses aggregating thirty semester-hours, excluding cross-listed courses, and including at least one course requiring substantial supervised writing, and
2. a grade-point average of at least 2.3 and status in good standing under the rules of the Law School.

M.L.S. candidates generally may not transfer into the J.D. program. Only applicants with a genuine interest in a one-year program of legal studies should apply. Note that the M.L.S. degree does not qualify one to sit for a bar examination or to practice law.

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*Beyond the Curriculum*



## Publications

*Law and Contemporary Problems.* Since 1933, the Law School has published the quarterly, *Law and Contemporary Problems*. The journal is distinctive among professional legal publications in both format and content. Each issue is devoted to papers on a particular topic of contemporary interest. These topics often reflect an interdisciplinary perspective with contributions by lawyers, economists, social scientists, scholars in other disciplines, and public officials. The journal also publishes student notes related to past symposia.

The journal is widely distributed, and its subscribers include general university libraries, governmental agencies, and foreign educational institutions, as well as the more traditional law libraries and law firms. *Law and Contemporary Problems* is monitored by a general editor and a faculty advisory committee.

Twenty-five upperclass law students serve on the editorial staff of this publication. Ten rising second-year students are selected each year on the basis of academic performance during the first year of Law School and demonstrated writing ability in an annual writing competition. Five rising third-year students are selected each year on the basis of academic performance during the first two years of Law School.

*Duke Law Journal.* The Law School publishes the *Duke Law Journal* six times a year. Edited by students, the journal is among the most prestigious and influential legal publications in the country. Approximately one-third of the contents of each issue consists of student notes dealing with current legal developments; the rest of the issue is devoted to articles and comments by professors and practitioners. Full responsibility for the selection and editing of material is vested in the journal's student editorial board and its elected officers.

Each year one journal issue focuses on topics in administrative law. The journal frequently devotes an issue to a symposium. Recent symposia topics include the frontiers of legal thought, the independence of administrative agencies, and legal responses to changes in corporate structure.

The journal staff of approximately fifty students is chosen on the basis of academic performance in the first year and/or demonstrated writing ability in a writing competition. Students may also seek membership on the journal by submitting a publishable student note.

*Alaska Law Review.* Since 1983, Duke Law School has published the *Alaska Law Review*. As Alaska has no law school but has the highest number of lawyers per capita of any American state, the Alaska Bar Association contracted with the Law School to provide a professional law journal responsive to the needs of Alaska's diverse legal community. Alaska has a range of cutting edge legal issues in the areas of natural resources law, environmental law, land use planning, economic development, state-federal relations, and Native American rights.

While supervised by a faculty advisory committee and a general editor, student editors have primary responsibility for writing, editing, and managing the *Alaska Law Review*. Twelve rising second-year students are chosen as editors on the basis of excellent first-year grades and/or superlative performance in a writing competition.



Several students may also be selected for membership by submitting a publishable note.

**Duke Journal of Comparative & International Law.** The *Duke Journal of Comparative & International Law* was established in 1990. The journal, which is published semi-annually, draws on the faculty's academic specialties and on the Law School's J.D./LL.M. in International and Comparative Law degree program. The journal publishes articles from international scholars and practitioners and student notes.

Approximately ten staff members are selected annually on the basis of writing ability demonstrated by the submission of a publishable note or superlative performance in the annual writing competition. Several international students earning the LL.M. degree are also selected each year on the basis of academic record and/or special skills or interests that indicate their likely contribution to the journal.

**Duke Journal of Gender Law and Policy.** The Law School's newest journal, the *Duke Journal of Gender Law and Policy*, was established in 1994. It is an interdisciplinary publication devoted to discussion of gender issues in the context of law and public policy. The journal encourages works from multiple perspectives, with particular emphasis on practical analysis, in an effort to identify the connections between social science and the law, scholarship and public policy, and academic work and professional practice. Recent issues focus on adoption law and policy, and women in sports.

The journal is staffed by students from the Law School, the Terry Sanford Institute of Public Policy, and the Duke Graduate Program in Women's Studies. To be accepted for membership, students must submit a statement of interest and satisfy the eligibility requirements related to the school in which they are enrolled. The journal is advised by a faculty board whose members are drawn from the faculties of the Law School, the Terry Sanford Institute of Public Policy, and the Women's Studies Program.

**Duke Environmental Law and Policy Forum.** The Law School began publishing the *Duke Environmental Law & Policy Forum* in 1991. The forum is an interdisciplinary annual magazine which is managed through the Law School but has a strong connection to Duke University's School of the Environment. The forum publishes legal and policy articles from academics and professionals as well as student notes. To fulfill its commitment to both legal and policy analyses of environmental issues, many of the forum's forty or so staff members are joint degree students from the Law School, the Terry Sanford Institute of Public Policy, and the Nicholas School of the Environment.

Recent topics covered in the forum include international environmental norms and assessment requirements, corporate responsibility to reduce solid waste, review of wetlands classifications, an analysis of the Clean Air Act Amendments of 1990, and extraterritorial enforcement under NEPA.

[Information about the publications of the Duke University School of Law is also available at the Law School's World Wide Web site: <http://www.law.duke.edu>.]

## Honorary, Professional, and Social Organizations

**American Bar Association's Law Student Division.** The ABA/LSD allows law students to make contact with the nation's largest professional association for lawyers, the American Bar Association. A small enrollment fee entitles the Law Student Division member to a subscription to the ABA magazine, *Student Lawyer*, to various product discounts, and to information about the ABA's programs and publications on specialized areas of the law. The ABA/LSD also promotes various advocacy and essay contests throughout the school year.

**American Civil Liberties Union, Duke Chapter.** Newly formed in 1996, the student chapter of the American Civil Liberties Union (ACLU) was formed to further the objectives of the national ACLU and the North Carolina ACLU. The major purpose of the chapter is to advance the cause of civil liberties in North Carolina and at Duke University, including the rights of free speech, free press, free assemblage, equality

before the law, and other civil liberties.

**Asian Law Association.** The purpose of the Asian Law Association is two-fold. First, it provides an organization where the members of the Law School community may explore issues and engage in activities that are of particular benefit and concern to American students of Asian decent, foreign students from Asia, and other students and alumnae interested in Asia and law. Second, it provides an organization that can enhance the quality and accessibility of Asian law resources at Duke University. Membership is open to the entire student body.

**Black Law Students Association.** The Law School chapter of BLSA is affiliated with the regional and national BLSA. The aims of the local chapter are to provide a responsive student organization to aid the individual black law student at Duke and to instill a greater awareness of and commitment to the needs of the black community.

**Christian Legal Society (CLS).** CLS is a nationwide organization dedicated to teaching the members of this nation's legal profession about the vertical dimension of life, without which it is impossible to rightly love and serve our neighbor and to defend the religious freedom for people of all faiths. The Duke chapter is committed to these goals and also is a fellowship of students working to integrate their faith in Christ with their Law School experience and their legal careers. Activities include Bible studies, fellowship events, discussion meetings, public service, and speakers.

**Co-Counsel: Pre-Law Advising Program.** The purpose of the Pre-Law Advising Program is to provide the Duke University undergraduate community with advice and direction regarding the pursuit of legal studies. The aim of the program is to supplement the pre-law advising mechanisms currently in place at the university by providing pre-law students with access to students currently in law school.

**Committee on Gay and Lesbian Legal Issues.** COGLLI is an organization open to all students designed to promote the awareness of sexual orientation in society and in the law. The committee seeks to provide a forum for discussion of gay and lesbian issues and to sponsor related events at the Law School. The long term goals are to promote tolerance, open mindedness, and acceptance of sexual diversity both in the legal community and in society at large.

**Criminal Law Society.** The Criminal Law Society, formed in 1995, is an association of students interested in either prosecution or criminal defense, as well as those who find criminal law issues interesting from a purely academic perspective. The primary goal of the organization is to organize speaking events and professional networking opportunities for students whose career goals center around the practice of criminal law.

**Deans' Advisory Council.** Members of the Deans' Advisory Council are selected by several deans and administrators of the Law School. Selection for membership reflects the collective judgment that the student is unusually deserving of trust and respect, and manifests traits for which the school would like to be known. The work of the council is to assist the administration of the Law School in its public contacts. Members represent the school in dealing with admissions applicants, placement interviewers, alumni, supporters, and guests. Membership in the organization generally continues after graduation; alumni members continue to assist in the same areas of administrative work. Membership involves a substantial commitment of time and energy to the welfare of the school.

**Domestic Violence Advocacy Project.** The Domestic Violence Advocacy Project is a volunteer group of Duke law students trained to help battered women in Durham County. From their courthouse office, advocates guide victims through criminal and civil proceedings. Women are first counseled individually by the advocates to gauge their need for social services or for a civil protective order. If there is a criminal case, advocates prepare case summaries for the prosecutor and accompany victims to court.

**Drama Society.** The Drama Society was founded to provide a nonacademic respite from the day-to-day rigors of law school through theater. The society's purpose is to produce plays in which Duke law students get an opportunity to act, produce, and direct.

**Duke Bar Association.** The Duke Bar Association coordinates professional, social, and other extracurricular activities of the student body. The association resembles in its composition and purpose both a university student government and a professional bar association. It takes care of student grievances and serves as a mediator between students, faculty, and the administration. The association oversees all student organizations, publicizes Law School activities, sponsors athletic and social programs, and disburses its dues funds among the school's organizations.

**Duke Business and Securities Law Association.** The DBSLA was founded on 1995 to provide a bridge between the business and law communities at Duke. The mission is to provide a forum for students, faculty, and professionals to explore current issues in various fields of business- and securities-related law. The goal is to facilitate interaction among business and law students and enable each group to benefit from the experiences and insights of the other. The organization seeks to create opportunities for students of Duke's Schools of Business and Law to leverage the resources of the other so they may gain a better understanding of the ways in which their respective fields interrelate. The DBSLA aims also to provide job search assistance to students interested in business-related professions and better enable them to examine a broad range of career pursuits.

**Duke Law Film Society.** The purpose of the Duke Law Film Society is to educate and entertain the Duke Law community by means of film presentation.

**Duke Law Republicans.** The Duke Law Republicans work closely with the Durham County Republican Party to assist Republican candidates for state and federal office. The organization arranges for candidates to visit the Law School and meet with students and faculty and assists students in registering to vote in North Carolina.

**Duke Project on International Humanitarian Law.** Since 1994, this group has provided an opportunity for students to engage in meaningful research related to the International Criminal Tribunal for the former Yugoslavia and for Rwanda. Students are in direct contact with officials from the Office of the Prosecutor for the tribunals and have enjoyed regular opportunities to meet with those officials during their visits to Durham.

**Environmental Law Society.** The ELS promotes student discussion and awareness of environmental issues by partially sponsoring the annual Cummings Colloquium on Environmental Law, hosting individual speakers and student discussions with lawyers practicing in environmental law, coordinating social and community service events, and sponsoring an annual 5K Fun Run/Walk to benefit a local environmental organization. Its goals are to enhance legal education through the creation of a vital environmental law program at the Law School and to explore summer internships and career opportunities in environmental law in both the public and private sectors. Membership is open to all interested students.

**Federalist Society.** The Duke chapter of the Federalist Society is a group of conservative and libertarian students interested in the current state of legal order. The society is founded on the principles that the state exists to preserve freedom, that the separation of governmental powers is central to our Constitution, and that it is the province and duty of the judiciary to say what the law is, not what it should be. The society seeks both to promote an awareness of these principles and to further their application through its activities. In the past, the group has hosted distinguished judges and other speakers and has sponsored debates between members of the academic community. Membership is open to interested students.



**Graduate and Professional Student Council (GPSC).** The GPSC represents students in the business, divinity, environment, graduate, law, medical, and nursing schools. These schools comprise approximately 4,000 students or nearly 40 percent of Duke's student body. GPSC appoints representatives to many university and trustee committees and responds to proposals and reports. GPSC also plans interdepartmental and interschool social events, publishes a monthly newsletter, and conducts an annual survey.

**Health Law Society.** The Duke Health Law Society is a group of students dedicated to the investigation and discussion of the role of the legal profession in today's health care system. The group works to introduce this important issue to the Law School community by sponsoring lectures and seminars and initiating broad-based dialogue. Membership is open to all students interested in these issues.

**Hispanic Law Students Association.** HLSA brings together a variety of individuals in order to discuss the issues they will face as Hispanic lawyers in the future, such as: their responsibility as Hispanic lawyers in society, the need for positive role models in Hispanic communities, and the availability of inexpensive/free legal aide. These discussions are usually intermingled with social activities where Hispanics and other law students can experience the richness of the Latin culture. HLSA is also very active in the university Hispanic group MI GENTE, which sponsors SALSA parties and other social events.

**Intellectual Property Law Society.** Newly formed in 1996, the Intellectual Property Law Society hopes to bring together law students and scientists who are doing cutting edge work in this booming field. Law students may develop a procedure for assisting the scientists with patent applications. The group will also sponsor speakers and panel discussions on patent, trademark, copyright, telecommunications, and other closely related fields.

**International Law Society.** The International Law Society coordinates law students' professional and academic activities in the area of international law in four ways. First, it sponsors a team to participate in the annual Philip C. Jessup International Moot Court Competition. Second, it organizes an annual Distinguished Speakers Series with lectures focusing on timely issues related to international law. Third, it collects and disseminates information about the study and practice of international law. Fourth, it promotes interaction between foreign and American students at the Law School through brown bag lunches, language tables, and other social activities.

**Jewish Law Society.** JLS is an organization of law students, faculty, and alumni who share an interest in Jewish legal issues and sociopolitical concerns. The purpose of the organization is to serve as a forum in which beliefs touching upon those concerns may be expressed. JLS sponsors lectures and social events.

**The Moot Court Board** is composed of second- and third-year students who represent the highest level of oral and appellate advocacy at Duke Law School. Members are selected from the top finishers in intramural moot court competitions held each Spring. Board members represent Duke at tournaments around the country, including events in Washington, DC, New York City, Nashville, and New Orleans, and recently won the Burton Wechsler First Amendment Championship and the Sutherland Cup Competition. Board members also direct the annual Hardt Cup and Dean's Cup Intramural Competitions, as well as the Rabbi Seymour Siegel Moot Court Competition, an intercollegiate competition focusing on ethics.

**Parents Attending Law School (PALS)** is a social network and support group for male and female law students who have young children. The group assists the admissions office by corresponding with applicants who have questions about child care, schools, and related concerns. PALS also maintains a small study room, equipped with a networked computer, that is available to parents who must bring their children



to the law school occasionally. PALS also sponsors or co-hosts programs pertinent to topics such as "Balancing Career and Family," and holds family-based social activities such as a Holiday Party and an Easter Egg Hunt.

**Phi Alpha Delta.** Phi Alpha Delta is the largest international organization of lawyers and consists of approximately 150,000 members throughout the world. The purpose of the fraternity is to form a strong bond uniting students and teachers of law with members of the Bench and Bar in a fraternal fellowship designed to advance the ideals of liberty and equal justice under the law, to stimulate excellence in scholarship, to inspire the virtues of compassion and courage, to foster integrity and professional competence, to promote the welfare of its members and to encourage moral, intellectual, and cultural advancement so that each member may enjoy a lifetime of honorable professional and public service. In furtherance of that purpose, the organization sponsors social events and community activities, hosts speakers, and offers financial assistance.

**Prisoner Rights Project.** The PRP is a volunteer organization of law students. Its goals include educating prisoners about the law and criminal procedure, promoting their rights to humane conditions, and assisting them in preparing postconviction motions. Volunteers answer prisoner questions about court procedure, sentencing classification, privileges, discipline, medical care, and conditions of confinement generally.

**Public Hearing.** Public Hearing is Duke Law School's co-ed, a capella singing group. The group is dedicated to fostering a sense of community and spirit within the Law School by performing concerts at the Law School and at Law School functions. Public Hearing also provides entertainment for patients in Duke's hospitals and medical facilities.

**Public Interest Law Society.** A dedicated group of law students who are interested in public service/public sector careers comprise the membership of the Public Interest Law Society (PILS). PILS works with the Office of Career Services to facilitate a wide range of programs and resources on public interest employment. Special projects, such as a comparative study of loan forgiveness programs, are also spearheaded by PILS.

**Rape Crisis Project.** The goal of the Rape Crisis Project is to assist the Rape Crisis Center of Durham by providing legal research regarding North Carolina case law and statutes, preparing legal information for the benefit of the center's staff, clients, and volunteers, and assisting in other promotional and educational projects.

**Sports and Entertainment Law Society.** The Sports and Entertainment Law Society was formed in 1989 and sponsors speakers on different aspects relating to legal issues in the sports and entertainment industries.

**The Student Funded Fellowship Board** is open to any students who are interested in the goals of the organization and who are willing to participate in its activities. The primary purpose of the board is to raise money from students and faculty to fund other students to work in the public interest for a summer. The board is presently expanding its work in hopes of fostering an atmosphere at the Law School more conducive to public interest law. Within the next few years, the board will merge with the School's Public Interest Law Foundation and will add the responsibility of raising and distributing funds for postgraduate public interest jobs.

**Volunteer Income Tax Assistance.** For many years law student volunteers have provided tax preparation assistance to low-income people in the community. Two or more sites in Durham are staffed by the Law School for eight weeks prior to the tax filing deadline.

**Women Law Students Association.** The Women Law Students Association provides both a social and professional network for women law students at Duke. WLSA takes an active part in the school's annual Conference on Career Choices and

sponsors frequent speakers and guest presentations. The group has also initiated a mentoring program, which matches students with practicing attorneys in the area, and maintains a statewide network with women's groups at other law schools in North Carolina. WLSA has taken the lead in sponsoring other programs at Duke Law School such as SafeWalks and the Domestic Violence Advocacy Project. Members also teach an undergraduate course on women and the law.

[Information about some of the student organizations at the Duke University School of Law is also available at the Law School's World Wide Web site: <http://www.law.duke.edu>.]

## Student Pro Bono Activities

The Pro Bono Project was started at Duke in the fall of 1991 as a voluntary program "to encourage and help students volunteer their services to the community in response to student and faculty interest in pro bono work." The project is overseen by Carol Spruill, the director of Public Interest and Pro Bono. The project is managed by Cindy Adcock, the Pro Bono coordinator.

The Pro Bono Project provides bright, energetic law students with the opportunity to explore the world of public service at a time when they are deciding on their careers and contemplating the civic contributions which they will make throughout their careers. The project provides students "easy access" to opportunities, during the school year, to work at charitable, civic, non-profit, governmental, religious, and educational institutions in the Law School's surrounding community. In this way, the project becomes a link between the Law School and its community. Responsive to the needs of the community and the needs of the legal community, the project has adopted a goal of every student volunteering 30 hours of their legal skills to the community while in law school.

Beyond the value to the community and beyond the lessons of public interest work itself, the project enhances the students' legal and professional skills. The students have an opportunity to learn about how law is practiced in a variety of settings. They are stimulated by first hand contact with people who have very real legal problems. They gain confidence as they learn that they have the ability to help people solve problems. And after a student's third semester at the Law School, they can be certified to represent clients, under the supervision of an attorney, in court proceedings. For those students seeking public interest as a career, it is an opportunity to demonstrate their commitment through service. For all students, it is an opportunity to develop important professional skills and contacts.

In 1998, placements were available in these and other areas: the environment, trial and appellate criminal practice, health care access, mental health, economic development, education, consumer protection, child abuse and neglect, juvenile delinquency, immigration, civil liberties, AIDS law, international human rights, women's rights, prisoners' legal services, employment law, racial justice, mediation, death penalty litigation, domestic violence prevention, social security and poverty law.

## Public Interest Programs

Public Interest Life at Duke Law School involves student organizations such as the Public Interest Law Foundation, clinical programs, pro bono and public service opportunities, law journals dealing with public interest topics, and school sponsored events and retreats.

The Public Interest Lunch Series and Book Club is the most established public interest program. Central to the program are discussions of books on public interest topics. Students assist the director of Public Interest and Pro Bono each spring in selecting the books to be discussed during the coming year. During the year, students and faculty come together to eat and to discuss the book and the related topic. Authors

are brought in whenever possible. At other meetings, often in coordination with the Office of External Relations or the Career Services Office, public interest speakers meet with students to discuss such topics as public interest careers, pro bono opportunities and current issues in public interest law. Public interest students learn by doing through the Pro Bono Project, the Criminal Litigation Course, the Death Penalty Clinic, the AIDS Legal Assistance Project and the Poverty Law Seminar.

## Entertainment and Recreation

Various recreational facilities are available on campus to students. The Bryan Center contains the Reynolds Theater and the Schaefer Laboratory Theater, as well as a film theater, an art gallery, banquet rooms which are available to students at minimal cost, and lounges and patios for student meetings.

Students of the Law School are also entitled to use the university gymnasiums, tennis courts, swimming pools, golf course, and other facilities. Within a short distance from the campus one may enjoy horseback riding, woodland hiking, and sailing. Other opportunities for physical activity are available in the intramural program, as well as through such activity groups as the outing, sailing, and cycling clubs. North Carolina's mild climate makes most outdoor sports possible during much of the school year. The Appalachian ski slopes are about three and a half hours to the west, the Outer Banks the same distance to the east.

University athletic contests are held on the campus at various times during the academic year. Duke is a member of the Atlantic Coast Conference.

## Employment Opportunities

The study of law is demanding. It is designed to occupy the full time of the student and calls for the highest level of concentration. It is unwise for students to dilute their efforts by outside work, especially during the critical first year of study. Accordingly, employment during the first year is strongly discouraged.

For those who find some outside earnings necessary to meet the expense of studying law at Duke and who qualify for the college work/study program under applicable federal regulations, arrangements have been made to provide some part-time employment in the Law School. A number of positions in the law library are filled by law students. Students are often employed in their second and third years as research assistants for faculty members. The university maintains a general placement office to aid in finding employment, and law students may serve as undergraduate residence advisers if they have been at Duke one year or have previously held similar positions.

**Employment Limitations.** While students should limit their employment for academic reasons, no student may be employed for more than twenty hours per week during the academic year. This twenty-hour limitation is not only a rule of Duke Law School, but is also a requirement of the American Bar Association for the status of a full-time student eligible to graduate in three years.

Law student spouses who seek employment will find opportunities as good here as in most other areas of the country. Laboratory and technical workers, secretaries, computer programmers, technicians, and medical personnel are among the workers most in demand in this area. The university personnel office and the Medical Center personnel office occasionally assist interested persons on locating suitable employment on campus.

## Student Life Policies

Students can find useful information on the Law School's World Wide Web site at <http://www.law.duke.edu>. Topics covered include Law School rules and policies, the Student Judicial Code, information on university-wide activities and divisions such as



the Student Health Clinic and Counseling and Psychological Services. Also included is the school's policy on accommodating the disabled.





*Law Library and Computing Services*



The published sources of law, in print and electronic forms, are the basic working materials for both the practicing attorney and the legal scholar. At Duke, law students have ready access to the materials of legal research through the resources of an excellent library collection, networked electronic information sources, and the skills of highly trained library and computing services staff to help them develop research skills to last throughout their professional careers.

Recognizing its place at the center of the Law School community, the Duke Law Library is designed to offer accessible, well-organized collections and services for students. Generous group and individual study areas are located in proximity to the most-used materials, and the library is fully networked to provide desktop access to electronic sources.

The library collection of over 500,000 volumes is a major research collection featuring comprehensive coverage of basic Anglo-American primary source materials, including nearly all reported decisions of federal and state courts, as well as current and retrospective collections of federal and state codes and session laws. Digests, legal encyclopedias, and other indexing devices provide access to the primary documents. Materials subject to heavy student use are available in multiple copies. Extensive collections of records and briefs from the United States Supreme Court, the Fourth Circuit Court of Appeals, and the North Carolina Supreme Court and Court of Appeals are maintained in microform and hard copy. The extensive and continuously expanding collection of legal treatises is organized in the familiar Library of Congress classification system and is indexed in the Duke University public on-line catalogue, which is accessible through the campus network, the World Wide Web, and through dial-in from outside the campus. Special treatise collections are maintained in several areas, including the George C. Christie collection in jurisprudence and the Floyd S. Riddick collection of autographed senatorial material.

The periodical collection includes extensive runs of all major legal research journals, bar association publications, institute proceedings, and newsletters. The library is a depository for United States government publications, with concentration on congressional and administrative law materials. Hard copy document holdings are supplemented by an extensive microform collection, which includes complete runs of the Congressional Record and the Federal Register, all post-1970 congressional materials, congressional committee prints dating back to the mid-nineteenth century, and a number of special subject collections. In addition, law students have access to the documents collection of the main campus library. Important state government documents are collected in both hard copy and microform.

In addition to its Anglo-American holdings, the library holds substantial research collections in foreign and international law. The foreign law collection is extensive in coverage, with concentrations in Canadian, other commonwealth, and European law and business law materials. Growing collections in Asian law are being developed. The international law collection is strong in primary source and treatise material on both private and public international law topics, and is supplemented by collections held at the main library.

The Duke University Libraries (Perkins, Law, Business, and Medical) together contain one of the major research collections in the country, holding over 4,000,000 volumes. Law students have access and borrowing privileges at other libraries in the Duke system and those at local universities. To obtain materials not available locally, the law library staff uses a variety of electronic networks to retrieve information from libraries and other sources throughout the country. Cooperation with other libraries, both on and off campus, ensures that materials are available when needed for the Law School community.

The success of a law school library depends as much on the quality of the services it provides as on the strengths of its collection. At Duke, the library staff includes ten librarians with graduate degrees, five of whom hold additional degrees in law. The manager of computing services also holds a degree in law and library science. The law-trained staff members serve as instructors in the first-year research and writing program and regularly offer seminars in topics of advanced legal research. They also provide instruction in effective use of the school's computer network and applications. The staff produces a series of research guides, a newsletter, and various current-awareness services, which has been honored with the American Association of Law Libraries' Law Library Publications Award. It also maintains bibliographies of books and articles by Law School faculty members. Services are also available through the library's World-Wide-Web home page. The library publications have been honored with the American Association of Law Libraries' Law Library Publications Award. Information about library services is also published on the library's World Wide Web home page <http://library.law.duke.edu>.

The library features nearly 300 individual study carrels, nearly all of which are wired for connections to the Student Research Network. Eighty-five carrels equipped with networked computer terminals and an additional twenty terminals are available for students in group study rooms and in the computer instruction room. The Student Research Network is designed to provide a workstation environment where law students can access and work with electronic and print information sources, create legal writing documents, and print them. The network provides shared access to word-processing software (WordPerfect and MS Word), legal research and other commercial on-line databases (Lexis, Westlaw, Dialog, etc.), electronic mail, the World Wide Web and other resources of the Internet, the university on-line catalog, and locally mounted databases. Duke faculty make increasing use of the network to distribute information to students and for course-related e-mail discussion groups, and are actively engaged in developing other productive uses of network technologies to supplement in-class instruction. The library is a member of the Computer Assisted Legal Instruction consortium (CALI), and makes CALI exercises freely available to students in support of the Law School curriculum.

Because of the growing reliance on computing and network technologies, all entering students in the JD program are required to own computers capable of accessing the law school network via dial-in from their residences. Computing Services staff offer advice to students about computer purchases and assist law students in making productive use of computers an integral part of their law school experience.

The staff of the Law Library in 1998-99 includes:

Richard A. Danner, B.A., M.S., J.D., *Senior Associate Dean for Library and Computing, and Research Professor of Law*

Mark P. Bernstein, B.A., J.D., M.L.S., *Associate Director of the Law Library and Senior Lecturing Fellow*

Hope E. Breeze, B.A., M.L.S., *Head of Technical Services*

Janeen J. Denson, A.B., M.S.L.S., *Head of Collection Services*

Melanie J. Dunshee, B.A., J.D., M.A.L.S., *Reference and Education Services Librarian and Senior Lecturing Fellow*

Doris M. Hinson, B.A., M.L.S., *Cataloger*

Janet Sinder, A.B., J.D., M.S., *Head of Information Services and Senior Lecturing Fellow*

Cathy Surles, B.A., M.L.S., J.D., *Reference Librarian*

Katherine Topulos, B.A., M.A., M.S., J.D., *Reference Librarian, Foreign and International Law Specialist, and Lecturing Fellow*

Gretchen Wolf, B.S., M.S., *Acquisitions Librarian*

The Computing Services staff includes:

Kenneth J. Hirsh, B.A., J.D., M.L.S., *Manager of Computing Services and Senior Lecturing Fellow*

Becky A. Mangum, B.S., *Assistant LAN Manager*

Alonzo A. Felder, B.S., *Faculty Computing Specialist*



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## *International Students*



## International Law Study at Duke

Duke Law School welcomes international students from countries throughout the world to all its programs of study. The presence of students from a wide variety of cultures and legal systems greatly enhances the education of all Duke Law School students. Highly qualified foreign law university graduates who seek exposure to the American legal system and the legal profession are encouraged to apply to one of the following degree programs. Information about opportunities for international students at Duke University School of Law is also available at the Law School's World Wide Web site: <http://www.law.duke.edu>.

## Degree Programs for International Students

Juris Doctor (J.D.). International students with excellent academic qualifications and English proficiency may seek admission to pursue the J.D. and joint degree programs. Applicants should recognize that they will enter a program designed for extremely capable professional students who already possess a substantial background in American culture and familiarity with the American educational system. The burdens of a new educational system in a wholly new environment are especially demanding for students who have not previously studied in the United States.

International applicants whose first language is not English must present a high score on the Test of English as a Foreign Language (TOEFL). Applicants who already hold a university-level degree from an English medium institution may, however, inquire about exemption from this requirement. All J.D. applicants are required to take the Law School Admission Test (LSAT). Candidates who have earned professional law degrees in countries with a legal system not dissimilar to that found in the United States may be able to receive credit for as much as one-third of the course work required for the completion of the J.D. degree. Students who have completed the LL.M. degree in the United States may also apply to the J.D. program; in some cases, they may be able to complete the J.D. degree in fewer than three years. All inquiries about the J.D. program should be directed to the Law School Office of Admissions, which oversees admissions to this program. For further information, consult the following web site: <http://www.law.duke.edu>.

Master of Laws (LL.M.). The Duke LL.M. degree program is designed for graduates of non-American law schools. The LL.M. program typically enrolls about fifty-five to sixty students from more than twenty different countries. Participants in the LL.M. program will include practicing lawyers; judges; academicians; prosecutors; staff members from ministries, banks and corporations; and a small number of outstanding recent law graduates.

The LL.M. degree requires two semesters of study in residence at Duke and a minimum of twenty-one semester hours of course work. Students may elect to take one first-year course, which will bring them into contact with entering American J.D. students who are facing similar academic challenges for the first time. LL.M. students

will also enroll in a seminar or in an independent study course with a faculty member, the end product of both being the submission of a substantial piece of written work by the student. LL.M. students as a group undertake a one-credit Introduction to American Law course. The course is taught by members of the Law School faculty and provides insight into distinctive aspects of American law. The course also provides the opportunity to visit North Carolina and Durham courts as well as the Supreme Court of the United States. A two-credit legal research and writing course is required of LL.M. students who do not have a strong common law background. The course prepares students for the kinds of writing responsibilities expected of qualified American law practitioners. All LL.M. students will receive orientation to the Law Library and the computer system. Additional courses are individually selected by the student with the guidance of a faculty advisor. LL.M. students participate in classes with J.D. students and the same grading scale is applied. International students whose first language is not English receive extra time on final examinations, however. Students are expected to complete the degree in one year unless special alternative arrangements are made.

**Doctor of Juridical Science (S.J.D.).** International students who have already earned a degree in American law at the master's level may apply for admission to the S.J.D. program. Admission is extremely selective, and students should apply only if they have achieved exceptional academic records at both their home and their American institutions. S.J.D. candidates are expected to be able to demonstrate that they have the capacity to conduct original research and to produce a thesis which will be a significant contribution to legal scholarship. Applicants should submit transcripts from all previous academic institutions at which they have studied; references from at least two faculty members very familiar with the applicant's credentials, including one from a faculty member acquainted with the applicant's studies in the United States; a sample of written work; and a preliminary thesis proposal. Students admitted to the S.J.D. program will usually be asked to complete one to two semesters of course work at Duke before undertaking the thesis component of the degree. The student's research and thesis will be supervised by a faculty member highly qualified in that area of law and by two additional faculty members in the same or related fields. Prior to the thesis project, the candidate will sit for oral examinations and fulfill requirements recommended by faculty sitting on the Graduate Studies Committee. The S.J.D. normally involves a minimum of two to three years. It should be noted that very few students gain admission to this program of study.

## Admission of International Students

An admissions process separate from the J.D. admissions is maintained for foreign students applying to the LL.M. or S.J.D. programs. Prospective applicants should write for forms and information to Ms. Judith Horowitz, Associate Dean for International Studies. An application fee of \$65 is charged and should accompany the application. Students from countries where English is not the principal language are required to present a high score on the Test of English as a Foreign Language (TOEFL), which is administered by the Educational Testing Service of Princeton, New Jersey. For further information, appropriate officials at the student's university should be consulted.

Applications and supporting material should reach Duke by January 15. Students are advised that it may take up to two months for TOEFL examination results to reach Duke. Late TOEFL scores and other application materials can seriously delay or even jeopardize admissions decisions. Applicants will be notified of acceptance beginning in February. Admissions decisions will continue until the LL.M. class is full. It is recommended that applicants try to apply as early as possible. Admission is for the fall semester only. A deposit fee of \$500 will be required to confirm acceptance of a position at the Law School.





## Financial Aid

Duke offers limited financial assistance to international students. All non-U.S. citizens will need to provide proof of sufficient financial support for tuition and living expenses for the degree program before the university initiates the student visa process. Foreign students admitted to the J.D. program must demonstrate that they have funds available for all three years of study. The Law School does not award new scholarship funds on the basis of need or merit once the student matriculates.

## Housing

Duke University maintains a limited number of furnished apartments in which international students may reside. In addition to Duke University housing, there is an abundance of well-appointed, reasonably priced housing in the area. Compared to most urban areas, the cost of living and quality of life in Durham are excellent. Most students prefer to have a car since off campus public transportation is not readily available.

## Placement with American Law Firms

International students may find that they would like to complete their legal education with an internship at an American law firm. Students are welcome to use the services of the Law School Office of Career Services. The office sponsors special sessions for international students in order to explain the placement process, to help with writing resumes and with interview techniques, and to offer other kinds of assistance as necessary. The Office of Career Services will assist whenever it is possible in scheduling interviews. Students from Duke participate in an annual job fair held in New York at which law firms from the U.S. and abroad interview job applicants. The visa office at Duke will help students obtain permission to engage in a period of practical training following completion of the degree program. The Law School cannot guarantee that students will have success in locating a position with an American law firm to facilitate the job search. International students are advised to make contact with American law firms, if possible, before they leave their home countries. Students who have the benefit of at least two years of legal experience before they pursue the LL.M. degree are often the most successful in identifying positions with American law firms. Information about taking state bar examinations is available in the Office of Career Services. Many students prepare for the state bar examination at Duke University.

## Special Features of Duke for International Students

The size of the international student body at the Law School is large enough to make its presence felt at the school, but not so large as to be a totally separate entity. All international students are supported in their efforts to become an integral part of the Duke community. To this end, the university's International House sponsors orientation sessions, offers the opportunity for foreign students to elect to have a host family in Durham, and provides a number of special programs and services throughout the year. Duke Law School also conducts a several-day orientation for all new students and several separate sessions designated specifically for international student concerns. New international students at the Law School are assigned to upper-class students who act as special friends. International students are selected as representatives to the Duke Bar Association and the Deans' Advisory Council. All clubs and associations, but especially the International Law Society, encourage the participation of international students. The Duke Journal of Comparative & International Law provides opportunities for international students to submit articles and for as many as five LL.M. students to participate as staff members in the production of the journal.

Duke Law School has an associate dean whose office is responsible for the admission of international applicants, orientation, academic and adaptation counseling,

and other services for international students. Each LL.M. student is assigned to a faculty adviser who offers guidance with course selection. The legal research and writing course is carefully structured in order to familiarize students with the law library, with legal writing techniques of a gradually more demanding nature, and with the skills necessary for a beginning associate to function effectively in a law office. The introduction to American law course provides an overview of various areas of American law, of the legal profession, and of the judicial process. The goal of the LL.M. program is to provide international students with the most complete exposure to American law and culture that can be accomplished in one academic year.

All international students are welcome to attend the Law School's summer residential institutes. The Duke-Geneva Institute in Transnational Law is held during the month of July. The Institute is co-sponsored by the University of Geneva Law Faculty in Geneva, Switzerland. The Institute takes advantage of many international institutions located in Geneva to arrange for special sessions with highly-placed officials at those institutions. Courses are taught in English by both American (usually Duke) and non-American faculty, and LL.M. students enrolled at Duke may be able to earn up to six credits toward their degree. One course provides an introduction to the American judicial system. The Institute enrolls about sixty students from Duke and other American law schools as well as students and law graduates from law schools throughout the world.

A very similar institute, with a strong Asian and financial institutions emphasis, is similarly conducted in Hong Kong with the University of Hong Kong law faculty during the month of July. The Asia-American Institute in Transnational Law enrolls approximately sixty students from many different countries. Participants in the institute typically include judges, lawyers, students, faculty members and government officials. The largest groups of participants have come from the United States and Hong Kong, but other countries have included Bulgaria, Mongolia, Japan, France, Germany, Taiwan, Kyrgyzstan, the Philippines, Portugal, China, and Thailand. Brochures describing both institutes can be obtained from Duke University Law School.

*Career Services*

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## Career Services

The many advantages of attending a small, highly-regarded, national law school like Duke certainly extend to the area of career services and placement. In fact, Duke Law School offers one of the most successful career services and employment records among all American law schools. For example, in a relatively tight job market, members of the recent class of 1997 reported ninety-nine percent employment six months after graduation. We have every expectation that subsequent graduating classes of Duke Law School will enjoy similar results.

Duke Law School graduates find employment in all sectors of the legal profession. The class of 1997 presents a typical profile. Seventy-three percent of its graduates are presently employed across the United States in private law firms. Eighteen percent have taken prestigious clerkships with federal and state court judges. The remaining members of the class are employed by government agencies, public interest organizations, military JAG offices and public corporations.

The geographical destinations of our graduates are equally diverse. While a significant majority of our students take jobs in the eastern one-half of the United States, Duke Law School has over 6,600 alumni presently practicing law in all fifty states. This broad alumni base supports our students' networking efforts when involved in a job search.

Second-year law students at Duke experience similar success in the employment market. Through our fall On Campus Interview program, over eighty-three percent of the second-year class find summer clerkships in law firms throughout the United States at salaries which typically range between \$1,000 and \$1,800 per week. This past fall, over 360 legal employers from across the country visited Duke Law School to recruit from a pool of fewer than 190 law students. This extremely favorable employer/student ratio is one of the very best in the United States. The remaining members of the class will locate summer jobs through other means, often by working with our national Law School Alumni Network. Last year, the second-year class achieved a ninety-nine percent summer employment result.

Although first-year law students typically face a more difficult job market, Duke's first-years enjoy a relatively successful summer job search experience. Over ninety percent of these students locate summer clerkships with law firms, federal agencies, judges, and public interest organizations. Several find jobs as a result of Duke's



February On-Campus Interview program for first-year students. Some students find summer jobs clerking with legal employers in Europe and Asia in connection with Duke Law's summer programs in Geneva and Hong Kong.



The success of our nationally prominent placement program is a function of several factors, the most obvious being the extremely high caliber of individuals who attend Duke Law School. But also of significance is the level of hands-on, career-related support provided by the Law School's Office of Career Services to Duke Law students. Because of Duke Law School's relatively small size, students receive a significant amount of one-on-one counseling and preparedness training from our professional staff. Our goal in the Office of Career Services is to ensure that Duke Law students are as informed and prepared as possible as they enter a very competitive job market. We also strive to provide potential legal employers with information describing the qualities and capabilities of Duke Law students, thereby guaranteeing a high demand for a relatively small supply of Duke Law School talent.

In furtherance of ensuring well-prepared and informed law students, the Office of Career Services at Duke Law School hosts a variety of programs throughout the academic year aimed at increasing law students' job search skills and information base. Communications and interview skills, resumes and cover letters, and self-assessment techniques are some of the areas covered in our career development workshops. Additionally, practicing attorneys from across the country regularly visit Duke Law School to participate in panel discussions and seminars aimed at increasing student awareness of both available areas of legal practice as well as issues facing student law clerks and new lawyers. This office also maintains a state of the art on-line computer research capability which law students utilize for the most up to the minute information about the legal employment market.

Below are placement statistics for the three most recent graduating classes:

|                                      | 1995 | 1996 | 1997 |
|--------------------------------------|------|------|------|
| Inquiries Received                   | 533  | 545  | 630  |
| Interviews on Campus                 | 281  | 325  | 343  |
| Employers' Geographical Distribution |      |      |      |
| Northeast                            | 44%  | 45%  | 43%  |
| Southeast                            | 35%  | 34%  | 34%  |
| Midwest                              | 13%  | 12%  | 12%  |
| West                                 | 8%   | 8%   | 11%  |
| Student Information                  |      |      |      |
| Graduates Reporting Employment       |      |      |      |
| Six Months After Graduation          | 98%  | 98%  | 99%  |
| Employers' Geographical Distribution |      |      |      |
| Northeast                            | 34%  | 40%  | 42%  |
| Southeast                            | 44%  | 36%  | 33%  |
| Midwest                              | 12%  | 9%   | 8%   |
| West                                 | 10%  | 15%  | 17%  |
| Type of Employment                   |      |      |      |
| Private Firms                        | 68%  | 71%  | 73%  |
| Business/Corporations                | 3%   | 8%   | 3%   |
| Government and Public Interest       | 4%   | 5%   | 3%   |
| Judicial Clerkships                  | 24%  | 14%  | 18%  |
| Teaching/Advanced Study              | 1%   | 2%   | 1%   |

[Information about career services at the Duke University School of Law is also available at the Law School's World Wide Web site: <http://www.law.duke.edu>.]

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*Alumni Affairs*



## Alumni Relations

Though Duke Law School graduates are dispersed across the country and throughout the world, their relationship with the Law School remains close. The Duke Law School External Relations Office, working with the Duke Law Alumni Association, links the school's alumni with the Law School and with each other. Information about alumni programs sponsored by the Law School is also available at the Law School's World Wide Web site: <http://www.law.duke.edu>.

**Law Alumni Association.** Every alumnus/a of the Law School is a member of the Law Alumni Association. The Law Alumni Association Board of Directors, its governing body, consists of approximately thirty members, who serve three-year rotating terms.

**Reunions and Law Alumni Weekend.** The Law School External Relations Office organizes reunions by class at five-year intervals. The reunions are held in the spring on Law Alumni Weekend. A reunion chairperson from each class is responsible for helping to plan reunion activities and encouraging classmates to attend. At the 50th reunion, alumni are inducted into the Half-Century Club.

**Public Service Awards.** In 1985, the Law Alumni Association Board established the Charles S. Murphy Award to be presented during Law Alumni Weekend to an alumnus or alumna whose devotion to the common welfare is manifested in public or quasi-public service or in dedication to education. Charles S. Murphy, a North Carolina native, devoted himself to public service, serving in the administrations of Truman, Kennedy, and Johnson as well as serving as a Duke trustee and member of the Law School Board of Visitors. In 1994, the Law Alumni Association Board established the Charles S. Rhyne Award to honor an alumnus or alumna whose career has been devoted to private practice but who has also made significant contributions to public service.

**Alumni Publications.** The *Duke Magazine*, an award-winning alumni publication which provides news and features about University programs, faculty research, student life, and alumni activities is published for all Duke alumni. Through the magazine, alumni are informed about each other, campus changes, and issues affecting higher education generally and Duke specifically.

The Law School External Relations Office publishes the *Duke Law Magazine* twice yearly. It is sent to all Duke Law alumni and other members of the Law School community including students. Through the magazine alumni are informed of faculty work on important legal issues and programs at the Law School. An alumni section



includes an alumni notes feature through which alumni can keep each other informed of milestones in their professional and personal lives. It also includes articles on different segments of our alumni body and profiles of some interesting individuals.

The Law School External Relations Office also publishes a *Law School Annual Report* for the Law School at the end of each fiscal year, which is sent to all law alumni and others in the Law School community. It includes reports from all offices and departments of the Law School and is an excellent way to bring everyone up to date regarding the Law School.

**Local Associations.** The Law School External Relations Office coordinates and supports the activities of local law alumni associations. The purpose of the local association program is to establish and maintain a sense of community and identity with the Law School and among our alumni. We also hope to increase alumni awareness of the progress and needs of the school. These objectives are pursued through social and educational events for alumni which are attended by a Law School representative.

Besides serving a social and networking function for local alumni and encouraging a sense of community, these groups also provide some practical assistance to the Admissions and Career Services Offices of the Law School.

**International Alumni Programs.** The Law School also pursues a strong alumni relations program with our growing international alumni body. The Law School External Relations Office sponsors programs for current international students to explain alumni and development programs. There are many local associations outside the United States including Tokyo, Taiwan, and several in Europe. Alumni events are held each year in conjunction with the transnational institutes in Asia and in Europe, as well as an International Alumni conference.

**Alumni Programs for Students.** In response to both student and alumni interest, the Law Alumni Association sponsors a series of panel discussions featuring alumni in various legal fields. This program is composed of panels of alumni invited to the Law School to discuss timely issues in the legal community such as law firm delivery of pro bono service and the changing nature of legal practice. The Braxton Craven Inn of Court, a professional organization of attorneys, judges and students that holds regular meetings with educational programs, includes second and third year students each year providing valuable educational and networking opportunities.

In addition to coordinating these events, the Law School External Relations Office is involved with students and student organizations throughout their Law School careers, and, in fact, ushers them into alumni status by coordinating the Law School activities for Graduation Weekend. Students are invited to attend all alumni events at the school and make a significant contribution to the Annual Fund Campaign as volunteers during the annual telethons. The Law School External Relations Office is also available to individual students and to student organizations who wish to contact alumni.

**Alumni Admissions Interviewing Program.** In 1985, the Law School began a program which invites alumni to help in the application and admissions process. The program, which is administered by the Law School Admissions Office, involves alumni in recruiting and communicating with prospective students.

**Annual Fund Campaign.** Gifts made by alumni and other friends of the Law School to the Duke Law School Annual Fund provide flexible financial support to the school. These funds undergird the operating budget and pay for items that endowment funds, often designated for specific purposes, do not address and that tuition revenues fall short of covering. Duke Law alumni are very responsive to the Annual Fund Campaign.



## Appendix A

### UNDERGRADUATE INSTITUTIONS REPRESENTED IN THE 1997

|                             |    |                             |   |
|-----------------------------|----|-----------------------------|---|
| Agnes Scott College         | 1  | U. California-San Diego     | 4 |
| American University         | 1  | UC- Santa Barbara           | 1 |
| Arizona State University    | 2  | U. of Central Florida       | 1 |
| Baker University            | 1  | University of Chicago       | 1 |
| Baylor University           | 1  | University of Colorado      | 1 |
| Boston College              | 2  | University of Connecticut   | 1 |
| Bowdoin College             | 2  | University of Florida       | 4 |
| Bowling Green State Univ    | 1  | University of Kansas        | 1 |
| Brigham Young University    | 6  | U. of Massachusetts         | 2 |
| Brown University            | 5  | University of Michigan      | 5 |
| California State University | 1  | University of Minnesota     | 1 |
| Claremont McKenna           | 1  | U. of Missouri-Columbia     | 1 |
| Clemson University          | 1  | University of New Mexico    | 1 |
| Colgate University          | 2  | UNC - Chapel Hill           | 3 |
| College of St. Benedict     | 1  | UNC - Charlotte             | 1 |
| College of Wm & Mary        | 3  | Univ. of North Florida      | 1 |
| Colorado College            | 1  | University of Notre Dame    | 4 |
| Columbia University         | 1  | University of Pennsylvania  | 4 |
| Connecticut College         | 1  | University of Pittsburgh    | 1 |
| Cornell University          | 5  | University of Rhode Island  | 1 |
| Dartmouth College           | 8  | University of Rochester     | 1 |
| Davidson College            | 1  | U. of South Carolina        | 1 |
| Denison University          | 2  | U. of South Florida         | 1 |
| DePauw University           | 1  | University of S. California | 2 |
| Drexel University           | 1  | U. of Tenn. - Chattanooga   | 1 |
| Duke University             | 19 | U. of Tenn. - Knoxville     | 1 |
| Fairfield University        | 1  | U. of Texas - Austin        | 1 |
| Florida State University    | 1  | University of Utah          | 1 |
| Furman University           | 1  | University of Virginia      | 1 |
| George Washington Univ      | 2  | Utah State University       | 1 |
| Georgetown University       | 3  | Vanderbilt University       | 1 |
| Hamilton College            | 1  | Washington University       | 1 |
| Hanover College             | 1  | Wellesley College           | 3 |
| Harvard University          | 4  | Whitman College             | 1 |
| Illinois State University   | 1  | Williams College            | 1 |
| Indiana University          | 1  | Yale University             | 3 |
| James Madison University    | 1  |                             |   |
| Johns Hopkins University    | 2  |                             |   |
| Lawrence University         | 1  |                             |   |
| Luther College              | 1  |                             |   |
| Miami University, Ohio      | 1  |                             |   |
| Middlebury College          | 3  |                             |   |
| National Vietnam Univ.      | 1  |                             |   |
| Northwestern University     | 2  |                             |   |
| Oberlin College             | 2  |                             |   |
| Ohio State University       | 1  |                             |   |
| Oklahoma State Univ.        | 1  |                             |   |
| Pennsylvania State Univ     | 1  |                             |   |
| Pepperdine University       | 1  |                             |   |
| Pomona College              | 1  |                             |   |
| Princeton University        | 4  |                             |   |
| Rensselaer Polytechnic      | 1  |                             |   |
| Rice University             | 4  |                             |   |
| Rutgers University          | 1  |                             |   |
| Saint John's University     | 1  |                             |   |
| Santa Clara University      | 1  |                             |   |
| Skidmore College            | 1  |                             |   |
| Stanford University         | 5  |                             |   |
| SUNY - Binghamton           | 1  |                             |   |
| Trinity College             | 1  |                             |   |
| Trinity University          | 2  |                             |   |
| Tufts University            | 1  |                             |   |
| University of Alabama       | 1  |                             |   |
| U. California-Berkeley      | 5  |                             |   |
| U. California-Irvine        | 1  |                             |   |
| U. California-Los Angeles   | 2  |                             |   |



## Appendix B

### STATES REPRESENTED IN THE 1997 ENTERING CLASS

|                |    |
|----------------|----|
| Alabama        | 4  |
| Alaska         | 1  |
| Arizona        | 3  |
| California     | 23 |
| Colorado       | 2  |
| Connecticut    | 8  |
| Florida        | 11 |
| Georgia        | 5  |
| Hawaii         | 1  |
| Idaho          | 1  |
| Illinois       | 4  |
| Indiana        | 3  |
| Kansas         | 2  |
| Kentucky       | 1  |
| Maine          | 1  |
| Maryland       | 3  |
| Massachusetts  | 12 |
| Michigan       | 2  |
| Minnesota      | 3  |
| Missouri       | 2  |
| Nebraska       | 1  |
| New Hampshire  | 3  |
| New Jersey     | 8  |
| New York       | 17 |
| North Carolina | 17 |
| North Dakota   | 1  |
| Ohio           | 11 |
| Oklahoma       | 2  |
| Oregon         | 1  |
| Pennsylvania   | 6  |
| Rhode Island   | 2  |

|                |            |
|----------------|------------|
| South Carolina | 2          |
| South Dakota   | 1          |
| Tennessee      | 3          |
| Texas          | 6          |
| Utah           | 5          |
| Vermont        | 1          |
| Virginia       | 9          |
| Washington     | 1          |
| Wisconsin      | 4          |
| <b>TOTAL</b>   | <b>193</b> |

### INTERNATIONAL COUNTRIES REPRESENTED IN THE 1997 ENTERING CLASS

|                |          |
|----------------|----------|
| Canada         | 1        |
| Korea          | 1        |
| Lithuania      | 1        |
| Russia         | 3        |
| United Kingdom | 1        |
| Vietnam        | 1        |
| Virgin Islands | 1        |
| <b>TOTAL</b>   | <b>9</b> |







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*bulletin of*  
**Duke University**  
**Summer Session**  
**1998**

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## The Mission of Duke University

The founding Indenture of Duke University directed the members of the university to "develop our resources, increase our wisdom, and promote human happiness."

To these ends, the mission of Duke University is to provide a superior liberal education to undergraduate students, attending not only to their intellectual growth but also to their development as adults committed to high ethical standards and full participation as leaders in their communities; to prepare future members of the learned professions for lives of skilled and ethical service by providing excellent graduate and professional education; to advance the frontiers of knowledge and contribute boldly to the international community of scholarship; to foster health and well-being through medical research and patient care; and to promote a sincere spirit of tolerance, a sense of the obligations and rewards of citizenship, and a commitment to learning, freedom, and truth.

By pursuing these objectives with vision and integrity, Duke University seeks to engage the mind, elevate the spirit, and stimulate the best effort of all who are associated with the university; to contribute in diverse ways to the local community, the state, the nation, and the world; and to attain and maintain a place of real leadership in all that we do.

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The information in this bulletin applies to the academic year 1998-99 and is accurate and current, to the extent possible, as of January 1998. The university reserves the right to change programs of study, academic requirements, teaching staff, the calendar, and other matters described herein without prior notice, in accordance with established procedures.

Duke University does not discriminate on the basis of race, color, national origin, handicap, sexual orientation or preference, gender, or age in the administration of educational policies, admission policies, financial aid, employment, or any other university program or activity. It admits qualified students to all the rights, privileges, programs, and activities generally accorded or made available to students. For further information, contact the Office of Institutional Equity (919-684-8222).

Information that the university is required to make available under the Student Right to Know and Campus Security Acts may be obtained from the Office of University Relations at 684-2823 or in writing to 615 Chapel Drive, Box 90563, Duke University, Durham, North Carolina 27708.

Duke University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404-679-4501) to award baccalaureates, masters, doctorates, and professional degrees.

# Duke University Summer Session

**Term I**  
**May 21 - July 2**

**Term II**  
**July 6 - August 15**

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Office of Continuing Education and Summer Session  
Box 90059, or The Bishop's House, Rm. 202  
Duke University  
Durham, North Carolina 27708-0059  
Tel. (919) 684-2621 FAX: (919) 681-8235  
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Web Site: [www.learnmore.duke.edu/SummSess/](http://www.learnmore.duke.edu/SummSess/)

## Welcome to Summer Session 1998!

Summer Session provides an educational and residential experience quite different from that of fall or spring semester at Duke. Classes are smaller as a rule than in the academic year, and you have the opportunity to interact more closely with professors and peers. Central Campus Apartments afford a degree of independence that many students find a welcome change from dorm life. Summer is the time to concentrate on one or two classes; to cheer for the Durham Bulls; to raft down the Eno River; to learn how to cook; to find the night spots in Durham and Chapel Hill; to get to know Duke and environs in new ways.

If you are now, or have been, a student in good standing at an accredited institution of higher learning, and want undergraduate or graduate courses for academic, professional, or personal enrichment, then you are eligible to enroll in summer courses at Duke. High school graduates accepted at accredited institutions are also invited to register.

The pages that follow will give you the information you need to make your summer plans at Duke University. For further information about programs, admissions, registration, regulations, course descriptions, financial aid, and policies, please consult the appropriate current Duke University bulletin or call us at the Summer Session office, (919) 684-2621, e-mail [summer@acpub.duke.edu](mailto:summer@acpub.duke.edu), or consult our web site—[www.learnmore.duke.edu/SummSess](http://www.learnmore.duke.edu/SummSess).



# Calendar

## April

1 Wednesday Registration begins for Term I and/or Term II.

## May

12 Tuesday Beginning this day, Duke students must see their academic dean or director of graduate studies if telephone registration is denied.

21 Thursday Term I classes begin.

26 Tuesday Drop/Add for Term I ends at approximately 10:00 p.m. Duke students use ACES; non-Duke students call 684-2621 and leave your name, social security number, drop/add information.

## June

17 Wednesday Last day to withdraw W/P or W/F from Term I courses for compelling reasons.

29 Monday Term I classes end.

30 Tuesday Reading Period, Term I.

## July

1 Wednesday Term I final examinations begin.\* (See page 31 for examination schedule.)

2 Thursday Term I final examinations end.\*

6 Monday Term II classes begin.

8 Wednesday Drop/Add for Term II ends at approximately 10:00 p.m. Duke students use ACES; non-Duke students call 684-2621 and leave your name, social security number, drop/add information.

31 Friday Last day to withdraw W/P or W/F from Term II courses for compelling reasons.

## August

12 Wednesday Term II classes end.

13 Thursday Reading Period, Term II.

14 Friday Term II final examinations begin.\* (See page 31 for examination schedule.)

15 Saturday Term II final examinations end.\*

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\*Any deviation from the examination schedule must be approved by the director of the Summer Session.





*"Summer course work is much more relaxed. It's a close-knit and intimate learning environment."*

(Summer '97)

## Registration

**Incoming Duke Frosh.** Incoming Duke first-year students are permitted to attend Summer Session. However, as ACES PIN numbers will not have been assigned, incoming first-year students register using the registration form attached in the center of this bulletin. Registration changes must be processed through the Summer Session Office.

**Duke Students.** Returning Duke students register using ACES, the Automated Computer Enrollment System. Graduating seniors register using the registration form in this bulletin. Students desiring study abroad (see Study Abroad section on page 26) must register through the Office of Foreign Academic Programs (919) 684-2174. Students desiring Marine Lab courses (see Marine Lab section on page 17) register through the Duke University Nicholas School of the Environment, Marine Lab (919) 504-7502. Graduate and undergraduate students who plan to enroll for courses, research (graded or ungraded), or graduate continuation fee only in one or more terms of the 1998 Summer Session are urged to have their course programs approved by their respective schools or colleges. Typically, if a graduate student continuing in a degree program registers in the summer session, it is for continuation only.

**ACES PIN (Duke students only).** Duke students in residence during the spring semester receive their ACES personal identification number (PIN) from their advisors. Students not in residence during the spring receive their ACES personal identification number (PIN) with their mailed registration packet. The PIN for Summer Session is the same as the PIN for fall semester 1998.

Summer telephone registration begins April 1, for all Duke undergraduate and graduate students, regardless of the date of the registration window for fall semester, and continues through the first three (Term II) or four (Term I) days of each summer term. The ACES number is (919) 613-9999. Have your social security number, course call numbers, and your PIN available when you call. The ACES course call numbers in this brochure are the same as those in the Summer section of the Summer-Fall 1998 Official Schedule of Courses.

**Non-Duke Students.** Non-Duke students may be admitted as nondegree (unclassified) students by the director of the Summer Session for summer study if they meet one of the following conditions: (1) hold a degree from a college or university\*, (2) are presently in good standing at a college or university, (3) have left a college or university in good standing in the past, or (4) have been accepted for the fall at a college or university. No admissions testing is required nor is there an application fee. The completed registration form, included in this bulletin, should be mailed or faxed to the Office of the Summer Session, Box 90059, Duke University, Durham, NC 27708-0059; FAX: (919) 681-8235. Upon receipt of the registration form we will mail you a confirmation letter and fee statement, or an explanation of rejection. However, when registering late or close to payment deadlines it is advisable to send tuition and fees to the Office of the Bursar immediately (Box 90035, Duke University, Durham, NC 27708-0035). Registration forms received early will not be processed until summer registration begins on April 1.

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\* All references to "university" or "college" denote regionally accredited institutions.

**Interinstitutional Agreement.** One course per summer may be taken at a neighboring institution participating in this agreement (UNC-CH, NC State, and NCCU) provided that the student is *concurrently* enrolled at Duke for one full course credit. Credit so earned is not defined as transfer credit since grades in courses taken under this agreement are entered on the official record and used in determining the quality point ratio. The Duke student participating in this program pays the Duke tuition rate for the away course. This agreement does not apply to contract programs such as the American Dance Festival. For more information, contact the Office of the University Registrar, 103 Allen Building, (919) 684-2813.

**International Students.** Persons wishing to take Duke credit classes must have a TOEFL score of 550 or above. In addition, if they are not *currently* a university student in good standing, they must meet one of the following conditions: (1) have passed a university entrance exam (Baccalaurat, Abitur, etc.), (2) have completed an undergraduate university degree, (3) have left a university in good standing, or (4) have





been accepted to a college or university for the fall. Once an inquiry is received from an international student, an informational letter, visa request forms, and a copy of the summer bulletin are mailed to the student. The forms, which include a request for a financial statement from a bank certifying that sufficient financial support is available for study at Duke, will be used to complete an I-20 visa form that will then be sent to the student. The student should take this I-20 visa form to the nearest U.S. consulate in order to apply for a student visa for the U.S. It may be possible to use a tourist visa if only one course will be taken per summer term at Duke. The registration form, included in this bulletin, should also be completed and returned as soon as possible and at least one month in advance of the beginning of the term. Students may also be required to complete an immunization form. Inquiries should be received no later than mid-April in order to complete the registration process in a timely manner. Applicants will be assessed Federal Express charges on return paperwork if registration is received too close to the deadlines listed on page 3.

**Independent Studies.** An independent study enables a student to pursue individual research and reading in a field of special interest under the supervision of a member of the faculty. Independent studies, though not listed in the Schedule of Courses, are offered by most departments. Students may do an independent study course through the Summer Session either on campus or at a distance (yet in the U.S.) by obtaining and completing an independent study form from the department or from the Summer Session office. The completed independent study form must be submitted to the department of interest which issues an ACES course call number required for registration.

For independent study at a distance, there are additional requirements: the student must work with a colleague of a Duke faculty member at that distant site, or the necessary facilities and/or data for the research are available only at that distant site; no compensation (stipend or salary) may be received by the student for the research; the Duke student must be in weekly contact with either the Duke faculty member listed as course instructor or with the faculty supervisor at the site who is in turn in weekly contact with the Duke instructor; and a substantive paper containing significant analysis and interpretation is required to result from the experience. Tuition is the same as regular Summer Session tuition. For information on Independent Study Abroad, contact the Office of Foreign Academic Programs, 121 Allen Building, (919) 684-2174.

## Course Enrollment

Introductory level courses are numbered below 100; advanced level courses are numbered 100 and above. Courses numbered 1-49 are primarily but not exclusively for first year students; and courses numbered from 200-299 are primarily for seniors and graduate students.

**Maximum Course Program.** The maximum program for one term of the summer session is two courses, one of which may be a laboratory science course. In addition, a student may enroll in a physical education activity course for one-half course credit. (Semester hour equivalents are indicated in the schedule section of this bulletin.) A greater load may be possible with the approval of the student's dean or the appropriate director of graduate studies. Non-Duke students must obtain approval for an overload from the director of the Summer Session.

**Minimum Enrollment Required.** Some courses are offered subject to minimum enrollments. If a course must be canceled because of inadequate enrollment, this decision is made as early as possible in an attempt to avoid undue hardship on students. Students already enrolled in a course to be canceled will be notified immediately. If at all possible, courses are offered as scheduled.



## Tuition and Fees

(also see section on "Dropping, Withdrawal, and Refunds")

1. Tuition for undergraduates: \$1,560 for each 3 semester hour (s.h.) course, \$2,080 for each 4 s.h. course, \$1,040 for each half-course program (2 s.h.), \$520 for each quarter-course program (1 s.h.), and \$3,120 for each one and one-half course program (6 s.h.) offered at the Marine Laboratory. Charges for laboratory courses may not be split up to pay for the classroom portion separately from the lab portion, and vice versa.
2. Tuition for graduate students: \$520 per unit (s.h.); for an undergraduate course, the tuition rate is the same.
3. Ungraded graduate research: \$660 per unit.
4. Graduate continuation fee: \$1100 for the summer. (Typically, if a graduate student continuing in a degree program registers in the summer session, it is for continuation only.)
5. Tuition for physical therapy courses: \$550 per unit.
6. Tuition for graduate nursing courses: \$530.50 per unit.
7. Tuition for courses in the Divinity School: \$1,195 per course.
8. Applied Music Fees: \$152 for 1/2 hr. private lessons; \$305 for 1 hr. private lessons. (Music fees are in addition to regular tuition charges.)

**Health Fee.** **Duke students** registered for on-campus courses are required to pay a \$69 student health fee per enrolled summer term. **Duke graduate students** registered for Graduate Continuation only are required to pay a \$138 student health fee for the entire summer. **Non-Duke students** registered for on-campus courses are required to pay a \$69 student health fee for each summer term in which they are registered for two or more courses. **Marine Laboratory students** are required to pay a \$59 student health fee per term.

**Transcript Fee.** A one-time transcript fee of \$15 is assessed to all non-Duke students undertaking summer coursework for credit. Payment of this fee entitles the student to copies of the Duke transcript without further charge.

### Auditing Fees.

1. **Charged Audit.** Students carrying less than a full course program may be granted permission by the instructor and the director of the Summer Session to audit one nonlaboratory course except physical education activity courses, studio art classes, applied music courses, foreign program courses, independent study courses, and tutorials. Students must submit to the Summer Session office written permission of the instructor for the student to audit his/her class. Regular deadlines apply. Courses may not be changed from credit to audit (or vice versa) after the drop/add period.

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\*Graduate Continuation Fee. Graduate students who register for courses in either summer term will be prompted by ACES to register first for continuation. Please note that as long as you register for continuation for the same summer term in which you are taking courses, you will not be charged the continuation fee. Registering for a class in either summer term will meet any requirements for "continuation". However, if you are not registering for coursework, and you are a graduate student who is required to maintain registration during the summer, you should register for "continuation only" for the whole summer semester and the above fee will apply.

For Arts and Sciences offerings, the auditing cost is half the tuition fee for the course. Professional school course audit policies may differ; consult the school of interest for more information.

2. **Free Audit.** With permission of the instructor and the director of the Summer Session, students registered for a full course program (two academic courses in the same term) may audit a course at no extra charge (above exceptions apply). Regular deadlines apply.

## Payment of Tuition and Fees

Students are responsible for calculating their tuition and fees due using the information and fee schedule above—*bills are not sent to Summer Session students in time to meet the summer tuition deadlines*. All tuition and fees and any past due balance should be paid in the Office of the Bursar, 101 Allen Building (Box 90035), by the first day of the term for which you have registered. Problems with meeting these deadlines should be discussed with the Office of the Bursar and your academic dean prior to the start of the term.

Summer Session retains the right to withdraw students from classes if they never attend, have not paid tuition and fees, or if they have failed to clear with the bursar, by the end of the drop/add period. Those withdrawn for these reasons will be billed the health fee and an administrative withdrawal fee of \$150 per course (\$75 per half-course). Attendance in classes after the first three days of the term obligates the student for the full tuition and fees for the course. (See page 10 on procedure for officially dropping a course.)

Students who, subsequent to withdrawal, clear with the Office of the Bursar may, with written permission of their academic dean, be reinstated in their classes as originally registered and receive regular grades. The administrative withdrawal fee will stand and the student will be liable for full tuition and fees.



*"Your focus is only on one class or maybe two classes. The atmosphere is more relaxed."*

(Summer '97)

## Adding

Students may add a course or courses before the beginning of the term, or during the official drop/add period (see Calendar on page 3). Duke students must use ACES; non-Duke students must contact the Summer Session office.

Beginning May 12, all Duke students must see their academic dean or director of graduate studies if telephone registration is denied.

## Drop/Add

Drop/add (dropping a class and adding a class in its place) may be done prior to the beginning of the term or during the first three (Term II) or four (Term I) days of the term. There are no charges for drop/adds if this does not result in any reduction in course load in the same term. Duke students must use ACES; non-Duke students must contact the Summer Session office.

**Never attending a class for which you have registered, or nonpayment for a class, is not an official drop and *will not* drop you from the class roll(s) nor release you from financial obligations. Financial penalties will be assessed.**

## Dropping, Withdrawal, and Refunds

1. There is no financial obligation of tuition and fees for students who officially drop their course(s) prior to the first day of the term. Duke students must use ACES; non-Duke students must contact the Summer Session Office. Never attending a class for which you have registered, or nonpayment for classes for which you have registered, *will not* drop you from the class roll(s) nor release you from financial obligations. Financial penalties will be assessed.
2. There is a financial obligation of \$150 per course (\$75 per half-course or audited course) plus no refund of the health fee for students who drop their course(s) during the official drop/add period if this results in any reduction in course load not offset by adding a course or courses of equal value in the same term. Duke students should use ACES; non-Duke students and Duke students unable to use ACES must contact the Summer Session Office and leave a message on voice mail.
3. After the first three days of the term, students may withdraw from their course(s) for compelling reasons only with the permission of their academic dean and by turning in a completed withdrawal form to the Summer Session Office by 4 p.m. on June 17 for Term I; and July 31 for Term II. Duke students obtain withdrawal forms from their dean, and non-Duke students obtain them from the Summer Session Office. Students will receive either a *WP* or *WF* (Withdrawn Passing/Failing) from their instructor(s) for each course withdrawn on their official transcript. There is a financial obligation of full tuition and fees if the student withdraws after 10:00 p.m. on the final day of the drop/add period. By not officially withdrawing, and not attending, students may receive a grade of *F* on their official transcript.

## Financial Aid

**Duke Students.** A limited amount of financial aid is available to Duke undergraduate students for summer study on the Durham campus and for summer study abroad programs sponsored by the Office of Foreign Academic Programs. Summer financial aid, determined according to demonstrated need, may consist of institutional grant funds and/or low interest loans from the Federal Stafford Loan Program and the Federal Perkins Loan Program, or College Work Study funds. The summer financial aid for Durham campus study will count against the student's eight semesters of eligibility. To qualify for summer school aid, a student must be enrolled, or accepted for enrollment, at Duke during the academic year immediately preceding or immediately following the summer for which aid is requested. Inquiries concerning need-based financial aid availability and application procedures for the Durham campus should be directed to the Office of Undergraduate Financial Aid, 2106 Campus Drive (684-6225). *Applications should be submitted no later than two weeks before the beginning of each term to the Office of Undergraduate Financial Aid.*

Duke graduate students seeking financial aid for summer study should contact the financial aid officer of the appropriate graduate division.

Application for summer study abroad aid is accomplished by signing up in person in the Office of Foreign Academic Programs, 121 Allen Building. A full description of who is eligible for summer study abroad aid can be found in the foreign program flyers. The deadline for signing up is 5:00 p.m., Friday, February 27, 1998. **THIS DEADLINE IS ABSOLUTE; THERE WILL BE NO EXCEPTIONS.** (Students need not have been accepted into the program in order to sign up for aid, but must have applied to the program.)

**Non-Duke students** enrolled only for the summer may be eligible to borrow from an outside lender under the Federal Stafford Loan Program in their home state. They should contact their college's financial aid office or their state's department of higher education for information and applications.

**Scholarships, Fellowships, Traineeships and Fringe Benefits.** It is the responsibility of the student to make arrangements with the appropriate office or department and to make certain that payment, a transfer journal voucher, and/or other appropriate certification covering tuition and fees is received by the Office of the Bursar, 101 Allen Building (Box 90035) by the deadlines listed on page 3.

**Athletes.** Contact Betty Jessup, 105 Cameron Indoor Stadium, 684-2431.

**Employees and Faculty and their Spouses and Children** may qualify for educational assistance through Duke University's employee benefit plan. The "Duke Educational Assistance Certification Form" must be completed and submitted to the Bursar's Office by the first day of the term for which you are registered. Contact Jennifer Frazier, Benefits Administration, 705 Broad Street, to determine eligibility and to receive the certification form (681-4355). A course registration form can be found in this bulletin.



## Duke University Honor Code

An essential feature of Duke University is its commitment to integrity and ethical conduct. Duke's honor system helps to build trust among students and faculty and to maintain an academic community in which a code of values is shared. Instilling a sense of honor, and of high principles that extend to all facets of life, is an inherent aspect of a liberal education.

As a student and citizen of the Duke University community:

- I will not lie, cheat, or steal in my academic endeavors.
- I will forthrightly oppose each and every instance of academic dishonesty.
- I will communicate directly with any person or persons I believe to have been dishonest. Such communication may be oral or written. Written communication may be signed or anonymous.
- I will give prompt written notification to the appropriate faculty member and to the dean of Trinity College or the dean of the School of Engineering when I observe academic dishonesty in any course.
- I will let my conscience guide my decision about whether my written report will name the person or persons I believe to have committed a violation of this code.

I join the student body of Duke University in a commitment to this Code of Honor.

A complete copy of the code is available at the Summer Session office if you need further information.

*"Living on Central Campus means you have easy access to classes on West, yet you are far enough away to get away."*

( Summer '97)

## Facilities and Co-Curricular Activities

**The DukeCard.** All students enrolled at Duke University may be issued a DukeCard. This card serves as official identification for all activities and university privileges. Non-Duke students should report to the DukeCard Office, 024 West Union Building (684-5800), to have a DukeCard made and, if desired, encoded to access prepaid "flex" accounts for purchases in campus food, meal plans, bookstores, and retail establishments. The amount of money in a regular flex account may be \$25 or more and must be deposited at the DukeCard Office. A flex account for food only (dining plan debit account) can also be encoded here but will be billed to your bursar's account (see Dining Arrangements).

**Bookstores.** Call for hours and information. Textbook Store, Bryan Center: 684-6793. Medical Center Bookstore, 106 Facilities Center: 684-2717. Gothic Bookshop, Bryan Center: 684-3986. Cokesbury Bookstore, 017 Gray Building: 660-3417.

**Libraries.** Call for hours and information. Perkins Library, West Campus: 684-3009. Lilly Library, East Campus: 660-5995. Medical Center Library, located in the Sealy Mudd Building between North and South Hospitals: 660-1111. Divinity School Library, West Campus: 660-3450.

**Computer Resources.** Central Campus has its own computer room, located at 218 Alexander Avenue, Apt. C, containing a cluster of IBM PCs and Macintosh systems connected to DukeNet, which can be accessed with the DukeCard twenty-four hours a day. Also, two computer clusters are available in Perkins Library twenty-four hours a day. Other computer clusters are located in academic buildings on both West Campus and East Campus. For additional information consult <http://www.oit.duke.edu/clusters>.

**Summer Creative Arts.** To enrich your Summer Session experience the Office of University Life (684-4741) and the University Union, in conjunction with the Summer Session office, plan an artistically stimulating environment for the campus and community. Special events such as chamber music by the Ciompi Quartet, jazz in the Sarah P. Duke Gardens, carillon concerts, and film series are offered. See the Special Programs section for information on the American Dance Festival.

**Athletics.** The athletic department invites your participation in the Summer Session Intramural Program. Engage in intramural softball, 3 on 3 basketball, tennis, racquetball, or golf. Enter softball teams at Captains' Meeting, May 21 in Term I and July 6 in Term II, 6 p.m., Room 104, Card Gym. Play goes on from Monday through Thursday nights between 5 and 9 p.m. during both summer terms. In addition, you are eligible to use the many athletic facilities on Duke's campus, including basketball and tennis courts, swimming pools, track, and weight room (Nautilus, Universal machines, lifestep, lifecycle, rowing machines, and free weights). Physical education equipment is available to all students enrolled in summer school at no charge. Physical education lockers are available for use at no charge, but you will need to supply your own lock which needs to be removed after each visit. Call 613-7514 for more information on intramural sports and call 684-4006 for more information on physical education equipment and lockers.

*See also Special Programs section.*

*"I love having an apartment with a kitchen and a living room. And air conditioning!"*  
(Summer '97)

## Student Housing, Transportation, Food, Residential Programs

**Living Accommodations.** Students using university housing during the summer will live in Central Campus Apartments. These air-conditioned accommodations are fully furnished except for cookware, eating utensils, and linens. Amenities include an outdoor swimming pool, two lighted basketball courts, a volleyball court, and four lighted tennis courts. These facilities are bordered by a park with a covered picnic shelter. Single students will be housed, double-occupancy, in one-bedroom apartments at a cost of \$11.12/night per person. Married couples including at least one Duke summer student may live together in the apartments at the following costs: one-bedroom-\$22.24/night; two-bedrooms-\$27.80/night; or three-bedrooms-\$35.43/night. A lounge is available for residential programs. Complete laundry facilities are provided. For further information and a housing application, contact: The Department of Housing Management, Box 90451, (218 Alexander Ave., Apt. B), Duke University, Durham, NC 27708-0451. Tel. (919) 684-4304. Information and applications are also available on-line at <http://www.housing.duke.edu/summer>.





**Transportation.** University bus service operates seven days a week between the hours of 7:20 a.m. and 11:15 p.m. Consult the schedule at the Housing Office or at the Summer Session office. For ease of access, and in response to student input, classes will be held again on West Campus this summer. Students with cars must obtain a parking decal from the Parking Office, 2010 Campus Drive (684-7275), entitling them to park at Central Campus Apartments or in any ungated student lot on West Campus. There is no extra charge for the parking decal for students staying at Central Campus Apartments. Many students enjoy the short walk from Central Campus Apartments through the gardens to West Campus, or ride their bicycles. Bicycles may be rented from area bike shops. SAFE Rides, Duke's dusk to dawn escort service, is also available 5 p.m.-7 a.m. Call 684-SAFE (7233) for a van ride across campus or to some off-campus locations (service area maps available at Transportation Office, 684-2281).

**Dining Arrangements.** Summer dining plan debit accounts are entirely optional, but were developed in response to student demand. Three debit account levels are available: small (\$160 per term), medium (\$375 per term) and large (\$615 per term). Dining plans are charged to your bursar's account and encoded on the DukeCard at the DukeCard Office, 024 West Union, 684-5800. The dining accounts can be used only to purchase food. All campus dining facilities and several area restaurants accept payment via the DukeCard dining or regular flex account. More information is available from Dining and Special Events Administrative Office, 029 West Union, 660-3900.

Kitchens in Central Campus apartments provide another dining option to students living on campus; however, students must provide their own cookware. Grocery items, deli sandwiches, and snacks are available beside the swimming pool at Uncle Harry's General Store (accepts payment via the DukeCard).

**Residential Programs.** In order to enhance the quality of student life in Central Campus housing, a varied cultural, educational, and recreational program is organized by the Summer Session office. Activities include picnics, pizza nights, Chinese take-out, bagel brunches, ice cream socials, evening discussions with faculty and local experts on issues of current interest, along with outings to recreational sites and shopping centers in the RDU Triangle area. These opportunities enable you to get together with the Summer Session faculty and community in an informal way. In addition, study breaks and outings to special events in the surrounding area are organized (don't miss the annual 4th of July Eno River Festival). Calendars of events will be handed out at the Housing Office and in most classes during the first week of each term, or may be obtained from the Summer Session Office.

## Academic, Advisory, and Counseling Services

Students have access to a variety of support services while on the Duke Campus in the summer. *Counseling and Psychological Services* (660-1000), located in Page Building, provides confidential individual assistance with personal problems. *The alcohol and substance abuse coordinator* (684-3850), located in the Civitan Building, 2213 Elba Street, next to Duke North Hospital parking deck, offers counseling regarding addiction, whether experienced by yourself or your friends or family members. *The Women's Center* (684-3897), located between Canterbury and SAE, is an advocacy and support center for women concerned with such issues as sexual assault and harassment, eating disorders, and campus climate as a whole, and also sponsors programs designed to promote personal and professional development. *The Career Development Center* (660-1050), in 110 Page, provides numerous services designed to assist you with planning your career; these include use of a career resource library and access to vocational interest testing and a computerized career information data base. International students may obtain useful information and support at the *International House* (684-3585), at



2022 Campus Drive between East and West campuses. Smaller classes afford opportunities for academic advising and assistance from professors, and such specialized academic centers as the *Women's Studies Program* (684-5683), located in 210 East Duke Building, East Campus, are open to you during one or both summer terms. Academic assistance is available free of charge from the *Academic Skills Center* (684-5917) on the East Campus in individual sessions, or in workshops held at Central Campus apartments; lists of available tutors are provided in each summer term.



*"Small classes mean having more vested interest in the coursework."*

(Summer '97)

## Special Programs

**English for Internationals.** This two-week program in August is designed particularly for international students who will begin their studies in the U.S. in the fall and who desire to strengthen their English language skills as they pertain to academic life. Participants attend two classes each day: one focused on reading/writing skills and the other focused on speaking/listening skills. Students will also learn how to use campus technology and various academic resources. In addition, the program seeks to familiarize students with the campus "culture" and help them become more comfortable prior to the start of their formal studies. This is a non-credit program for which no grades are given. Call (919) 684-3379 for more information.

**Languages for Reading Purposes.** These eight-week, noncredit courses are intended for graduate students and other researchers who need to consult texts in French, German, Spanish, or classical/medieval Latin, and/or who need to satisfy reading knowledge requirements for graduate and professional programs. Students will gain reading skills through guided in-class work, supplemented by intensive independent study of necessary grammar and the opportunity to apply these skills to an individualized project. Limited enrollment. May 21-July 17, 1998, Mondays, Wednesdays, and Thursdays, 4:30-6 p.m. \$600 plus materials per course. For more information call (919) 684-2621.

**The Fuqua School of Business Summer Institute.** A five-week intensive English business program, this noncredit program concentrates on American business, communications, and culture and is intended for international students preparing for the M.B.A. or other professional programs in the U.S. July 6 - August 7, 1998, at the Fuqua School. Call (919) 660-7868 or 660-7865 for a brochure.

**The American Dance Festival.** This world renowned program of American and international dance attracts students and dance aficionados to the Duke campus every summer. Over a six-week period (June 11-July 25) you can take a wide variety of dance classes and workshops, participate in the ADF Arts Administrative Internship Program, or simply enjoy the performances. For course registration information or for a season performance brochure, write to the ADF, Box 90772, Duke University, Durham, NC 27708-0772; call (919) 684-6402; FAX (919) 684-5459; or e-mail: [adfnc@acpub.duke.edu](mailto:adfnc@acpub.duke.edu).

**Hosei University Exchange.** During the last half of Term II, a group of approximately twenty Japanese students from Hosei University in Tokyo will take classes at Duke and reside at Central Campus from late July to mid-August. The Hosei exchange provides an excellent opportunity for American college students to meet their Japanese counterparts without leaving the country. Call (919) 684-2174 for more information.

**Foreign Language Study Opportunities.** The summer provides an excellent opportunity to study a foreign language at the beginning, intermediate, or advanced level on the Duke campus. See the Arabic, French, German, Ancient Greek, Italian, Latin, and Spanish language courses in the schedule. See also Languages for Reading Purposes above.

**Duke University Nicholas School of the Environment, Marine Laboratory.** Located in Beaufort, North Carolina, the Marine Lab offers courses for undergraduates, graduates and postbaccalaureates. For information see <http://www.env.duke.edu/marinelab/marine.html> or contact the Admissions Office, Duke University Marine Laboratory, 135 Duke Marine Lab Rd., Beaufort, North Carolina 28516. Tel: (919) 504-7502; fax: (919) 504-7648; or e-mail: [hnearing@mail.duke.edu](mailto:hnearing@mail.duke.edu).

**PreCollege Program (Term II).** The PreCollege Program is designed to provide the academic challenge of college-level courses to qualified college-bound students and to help them prepare for the adjustments they will be making when they enter college. For

further information contact: The PreCollege Program, 1121 West Main Street, Suite 100, (919) 683-1725. Gifted local high school students may be eligible to take one course per term in the Summer Session. The Summer Session office has more information: (919) 684-2621.

**Summer Academy.** The Office of Continuing Education and Summer Session, in conjunction with Alumni Lifelong Learning, annually sponsors a series of residential learning experiences for adults called the Summer Academy. Held at the Trinity Conference Center on the North Carolina coast, the 1998 workshops will focus on creative writing, technical writing, creativity, and writing for health care professionals. For more information, contact Georgann Eubanks by telephone at (919) 684-5375 or via e-mail at [geubanks@mail.duke.edu](mailto:geubanks@mail.duke.edu).

**Youth Programs.** Duke Youth Programs attracts middle school and high school students from across the U.S. to its exciting summer camps. Offerings include the Duke Young Writers' Camp, Duke Creative Writers' Workshop, Duke Action Science Camp for Young Women, Duke Drama Workshop, and Expressions: Duke Fine Arts Day Camp. A new program for rising juniors and seniors on Preparing for College will debut this summer. For more information, contact: Duke Continuing Education, Box 90700, Duke University, Durham, NC 27708-0700; telephone: (919) 684-6259; fax: (919) 681-8235; e-mail: [learn@acpub.duke.edu](mailto:learn@acpub.duke.edu); or visit our web site at: <http://www.learn-more.duke.edu/Youth>.

**Markets and Management Studies.** The Markets and Management Studies Certificate is a six course, nondegree concentration (two core courses, one capstone course, and three electives) that provides a liberal arts approach to undergraduate business education. Its curricular themes center on (1) the globalization of the world economy and the importance of understanding organizational innovations in light of cultural and social differences; (2) the social determination of technological development, and the cultural factors influencing its effectiveness; and (3) the impact of social factors on management styles and practices, including issues of ethics. One or more core and elective courses will be offered each summer, and students will also have access to evening courses during the regular academic year, speaker series, a resource room for students, and special business case study and curriculum collections. Summer offerings in 1998 include: CA 180S.01 (Term I), ECO 165, ECO 173, ECO 181, EDU 140, MS 120, MS 161, and SOC 155. For additional information please contact Barbara Pollock, 254 Sociology-Psychology Building (or Box 90088), Duke University, Durham, NC 27708-0088. Tel: (919) 660-5759; fax: (919) 660-5623; or e-mail: [bpoll@soc.duke.edu](mailto:bpoll@soc.duke.edu).



## Special/Selected Topics Courses

### Term I

**CA 180S Cultures of Business and Science.** Ideas of culture drawn from anthropology will be used to consider the inner workings of science and business. The course will examine the roles of individuals, cultures, and social organizations in science and business practices. Students will also consider both the ways in which anthropology can aid business and the ways that business can help anthropologists understand complex work organizations. Examples from eastern and western Europe, the U.S., Japan, Africa, and Latin America will be explored. *Friedman.*

**CS 180 Magic and Superstition in the Ancient World.** This course will examine the practice of magic in antiquity and the figure of the ancient magician as mirrors for modern-day American society. Abundant material evidence of magical practice, such as curse tablets, voodoo dolls, and protective amulets, survive from antiquity. Literary narratives of the exploits of ancient witches, wonderworkers, and "divine men" complement the physical remains. Through an exploration of both types of sources, as well as of selected accounts of contemporary supernaturalism, we will encounter the irrational streak in ancient and modern culture. *Bernstein.*

**ENG 155 Contemporary American Writers.** Texts so lyrical they would make you cry, if you weren't already so *spooked*--by a female mystic who sings her own body electric, by a horseman on a heart of darkness trip, by a queenly mother who is good with a match, by ice people radiating pathos and need, and by a gangster who knows how to reason. The founding proposition of this course is that literature is not dead, multi-media protests to the contrary; and the best texts we now have to offer--however otherwise tagged as "ethnic narrative," "women's poetry," "the postmodern novel," and "American romance"--can educate your senses and touch-off your thinking like almost nothing else this new. Probable texts include: E. Annie Proulx's *The Shipping News*, Ron Hansen's *Mariette in Ecstacy*, E.L. Doctorow's *The Book of Daniel*, Mario Puzo's *The Godfather*, Sylvia Plath's *Ariel*, Toni Morrison's *Sula*, and Cormac McCarthy's *All the Pretty Horses*. *Ferraro.*

**ENG 169S.01 Frost and Eliot.** This course focuses upon a comparative study of two ostensibly contrary figures who largely dominated the scene of twentieth-century American poetry. The three major course objectives will be to understand and appreciate the major poetry of each writer; to elucidate a comparison and contrast between them; and, in so doing, to illuminate the larger crisis in culture that is reflected in their writings. Biography, interviews and letters, and other secondary sources will be referenced. *Strandberg.*

**ENG 169S.02 The Art of the American Short Story.** "Rip Van Winkle," "Murders in the Rue Morgue," "The Fall of the House of Usher," "Young Goodman Brown," "Rappaccini's Daughter," "Bartleby the Scrivener," or "The Lady or the Tiger"--which of these tales comes closest to being the 'perfect' American short story? This course will examine these and other stories as a means of determining why the American short story form has achieved world-wide fame. Most of the emphasis will fall on the early creation and development of the form by Washington Irving, Edgar Allan Poe, Nathaniel Hawthorne, Herman Melville, and Mark Twain. But we will also include such late nineteenth- and twentieth-century writers as Henry James, Kate Chopin, Stephen Crane, Ernest Hemingway, William Faulkner, Eudora Welty, Joyce Carol Oates, and John Updike. *Jones.*

**HST 106S.01 Australia and the British Empire.** This seminar considers the history of Australia in the context of the British Empire from the eighteenth to the twentieth century. Among the general themes we will consider are aboriginal society, colonial settlement and government, race relations, migration, national identity, imperial defense, and images of Australia. The course emphasizes primary sources, but we will also regularly draw on Australia's rich tradition of art, literature and film. *Harland-Jacobs.*



**HST 106S.02 The Civil War Reconsidered.** This course will examine the civil war in its broader social context: as a human event that involved military strategy, economic upheaval, political intrigue, social and cultural disruption, and, above all, the transformation of the lives of women and men, civilians and soldiers, blacks and whites, and rich and poor. *Bindman*.

**LIT 123 Sexual Politics: The Question of Pleasure.** This course examines perspectives on the role of pleasure in literature, art, and politics. Students will read novels and short stories, key statements on pleasure, politics, and the arts, and view selected film and video art that suggest a relationship between pleasure and the consumption of sexualized and racialized images. Emphasis on the idea of Black popular culture, and "feminist" art. Texts include *Waiting to Exhale* (McMillan), *Sula* (Morrison), *Justine* (Sade), and *The Autobiography of Alice B. Toklas* (Stein). *Doyle*.

**PHL 196S Environmental Ethics.** This course presents a philosophical study of American environmentalism, construed in terms of three ethical themes: the primordial experience of wilderness, the utilization of natural resources, and the practice of civil disobedience against both government and corporate authority. Readings will draw mainly from Thoreau, Muir, Pinchot, Leopold, and contemporary "radical" environmentalists. *Medeiros*.

## Term II

**CA 180S Anthropology of American Culture.** The various theoretical and methodological approaches that anthropologists have used to examine American beliefs and to explore particular social sites, including the rodeo, the high school classroom, the college campus, and the small claims court, will be explored. *McCollum*.

**CS 180 Magic and Superstition in the Ancient World.** See description above.

**ENG 170 Gender and Race in Twentieth-Century American Fiction.** From Kate Chopin to Margaret Atwood, from William Faulkner to Toni Morrison, major American writers have been preeminently concerned with issues of race and gender. Starting with novels by the four authors just named and also considering works by Native American and women ethnic authors, we will assess how and with what implications race and gender have been portrayed in some of the best novels written during the twentieth century in both the United States and Canada. *Davidson*.

**FR 142S The French Love Story.** What is it about the role of love in the life and image of the French? An examination of some of the key tales they tell themselves. How do women authors tell the story? How do men? Is there one plot or are there many? Does their view of love truly set them apart, or is the "French Love Story" a myth? If so, how has it come to be? Readings from Constant, Flaubert, Proust, Colette, Duras. In English. *Longino*.

**HST 196S History of Sexuality in America.** Exploration of how notions of sexuality, and people's experiences of it, have changed over time. Topics include the role of sexuality in colonization, the ideology and reality of family values over time among different groups of Americans, the relationship between heterosexuality and homosexuality, the making of gay and lesbian subculture, and sexuality and AIDS. *Lekus*.

**LIT 116 Studies in Film History: Silent Film.** This course celebrates the first centennial of cinema—from 1895 to 1995, from the spectacles of "primitive" cinema to the Golden Era of the silents ending with the advent of sound. Topics will include film's relation to other arts and art movements, women in silent film, national industry economics, change in exhibition styles, and the terrific aesthetic variety of silent movies. Directors/producers surveyed will include: George Melies, Alice Guy Blache, Edwin S. Porter, D.W. Griffith, Lois Weber, Dziga Vertov, Germaine Dulac, F.W. Murnau, Cecil B. DeMille, Carl Theodore Dreyer, Buster Keaton, and many others. *Paletz*.

**PHL 196S Philosophy and Feminism.** This course will explore the development and background of current trends in feminist theory. Readings will include differing perspectives within feminism, as well as specific issues within contemporary philosophy, such as the construction of feminist theory of knowledge. *Schiltz.*

**PSY170P,S Family Psychology.** Exploration of family relationships—marital, parent-child, and sibling—across the family life cycle. Subcultural diversity and the impact of gender will also be highlighted. Potential disruptions and dysfunctions in the family life cycle (e.g. marital conflict and divorce; mental or chronic illness; physical, sexual, emotional or substance abuse) and how families cope with such stressful disruptions will also be examined within the context of clinical research and treatment. *Rocheleau.*

### **ADDITIONAL INFORMATION REGARDING LIT 020S AND UWC 117S/ENG 117A COURSES**

**LIT 020S: Introduction to Literature.** Introduction to the study of literature and other forms of cultural expression, such as film. Different introductory approaches will be used in each section (for example, a systematic account of literary genres, a historical survey of ideas and forms of fiction, concepts of authorship and subjectivity, or of literary meaning and interpretation). More than one national literature or culture represented.

#### **LIT 020S MAY NOT BE REPEATED FOR CREDIT**

**LIT 020S.01 (Term I) "Rethinking Rock and Roll."** This course examines the role of rock and roll in postwar American and British society. We will explore rock and roll not simply as a musical style, but as a cultural formation linked to other modes of expression such as dance, style and fashion, film, video, fanzines, and novels. We will consider rock and roll as a potential site of, or source for, political struggle as well as its role in changing representations of youth, sexuality, race, gender, and class. An integral part of the course will be listening to and discussing music from many different periods and genres including blues and jazz, rockabilly, the "British invasion," acid rock, punk, disco, new wave, industrial, hip hop, house, and electronica. Readings will include academic and theoretical writing on popular music and culture, fanzines, journalism and possibly novels. *Middleton.*

**LIT 020S.01 (Term II) "American Fairy Tales."** Examining a range of literature, including Native American mystical tales, slave narratives, self-conscious literary fairy tales, and American books that borrow fairy-tale plot devices, this course will explore such issues as: are there important differences between oral stories and written ones, between intentional fairy tales and books that rely on fairy-tale plots and imagery? what is the role of magic in the fairy tale? what is "American" about American fairy tales? *Biberman.*

**LIT 020S. 02 (Term II) "Film, Television, and the Body."** This course will explore the various interactions and interconnections between contemporary image technologies and the body, and our ideas about the body. The course begins by exploring those cinematic genres which elicit a bodily response—horror, the melodrama, comedy—in order to counter the notion that when we enter the cinema we leave our bodies at the door; then turns to the recent revival of the notion of the "attraction," specifically with reference to new cinematic forms (Omnimax, Imax 3-D) and new technologies (the morph, virtual reality) which appeal to notions of the body and/or its transcendence; and concludes with a consideration of the place of the body in television spectatorship in relation to the notions of the cinematic body previously explored. *Beebe.*

### UWC 117S/ENG 117A MAY NOT BE REPEATED FOR CREDIT

**UWC 117S/ENG 117A: Advanced Composition I.** Emphasis on the connections between substance and structure; revision techniques and inventional procedures. Tailored to the level, needs, and interests of students who enroll. Prerequisite: previous University Writing Course or consent of the director of the Writing Across the University Program. C-L: English 117A.

**UWC 117S/ENG 117A (Term I) "Reviewing Culture".** This writing workshop introduces students to the art of criticism and reviewing. Students develop as writers by crafting publishable responses to books, film, plays, television, music, and art, and by closely attending to the best reviewers of our time. *Kellogg*.

**UWC 117S/ENG 117A (Term II) "The Contemporary Essay."** This course examines the ways in which essayists use personal narrative, close observation, critical analysis, and argument to reflect on certain aspects of contemporary life. After reading and responding to published essays, students will have an opportunity to create essays according to their individual interests. *Russell*.

Course Synopses—expanded course descriptions including methodology and anticipated readings and assignments—for many courses are available on the web: [www.learnmore.duke.edu/SummSess](http://www.learnmore.duke.edu/SummSess).





*"I found I could work during the day and take a class in the evening. Some really fascinating courses were offered at night."*

(Summer '97)

## Evening Courses

Evening classes are generally offered three times a week, Monday, Tuesday, and Thursday.

### TERM I

- AAL 165S: Modern Arabic Literature in Translation. 6-8:05 p.m. *Chergui*  
CA 180S.01: Cultures of Business and Science. 6-8:05 p.m. *Friedman*  
CS 180: Magic and Superstition in the Ancient World. 5-7:05 p.m. *Bernstein*  
ECO 083: Financial Accounting and Decision Making. 5-7:05 p.m. *Skender*  
EDU 108S: Teaching Practices in Elementary Language Arts and Content Areas. 5:00-8:10 p.m. *Riggsbee*  
EDU 140: The Psychology of Work. 5-7:05 p.m. *Ballantyne*  
HST 101C: Terrorism, 1848-1968. 7:20-9:25 p.m. *Miller*  
LIT 020S: Introduction to Literature ("Rethinking Rock and Roll"). 6-8:05 p.m. *Middleton*  
LIT 123: Sexual Politics: The Question of Pleasure. 5-7:05 p.m. *Doyle*  
MS 161: Marketing Management. 7:20-9:25 p.m. *Suhomlinova*  
PE 011.02: Cardiorespiratory Conditioning. Half course. 5-7:05 p.m. *Ogilvie*  
PE 170: History and Issues of Sports. 6:00-8:05 p.m. *Buehler*  
PHL 196S: Environmental Ethics. 5-7:05 p.m. *Medeiros*  
PSY 091: Biological Bases of Behavior: Introduction and Survey. 6-8:05 p.m. *Erickson*  
PSY 111: Learning and Adaptive Behavior. 5-7:05 p.m. *Schmajuk*  
REL 042: Islam. 6-8:05 p.m. *Ali*  
REL 185: Ethics and the Internet. 6-8:05 p.m. *Robinson*  
SOC 155: Organizations and Management. 5-7:05 p.m. *Suhomlinova*  
WST 103: An Introduction to Women's Studies. 7:20-9:25 p.m. *Staff*

### TERM II

- AAL 165S: Modern Arabic Literature in Translation. 6-8:05 p.m. *Chergui*  
FR 142S: The French Love Story. 5-7:05 p.m. *Longino*  
HST 195S: Russian Revolutionary Cinema. 7:20-9:25 p.m. *Miller*  
HST 196S: History of Sexuality in America: 1500-Present. 5-7:05 p.m. *Lekus*  
LIT 116/ENG 185/DRA 174: Studies in Film History: Silent Film. 6:00-9:25 p.m. *Paletz*  
MS 120: Managerial Effectiveness. 6-8:05 p.m. *Staff*  
PE 015.02: Weight Training. Half course. 5-7:05 p.m. *Falcone*  
PHL 196S: Philosophy and Feminism. 7:20-9:25 p.m. *Schiltz*  
SOC 011: Contemporary Social Problems. 7:20-9:25 p.m. *Simpson*  
UWC 117S/ENG 117A: Advanced Composition. 5:00-7:05 p.m. *Russell*



*"Instructors seem more willing to give their time for one-on-one discussion and assistance."*

(Summer '97)

## Interdisciplinary Viewpoints/Special Interests

Do you have special interests in certain topics? Are you eager to investigate a subject from various points of view? Summer 1998 provides you the opportunity to group courses in order to enhance your education. Here are some suggestions.

| INTEREST AREA                | SUGGESTED COURSES |   |
|------------------------------|-------------------|---|
| BUSINESS                     | CA 180S           | Cultures of Business and Science. Term I.                               |
|                              | ECO 083           | Financial Accounting. Term I & II.                                      |
|                              | ECO 153           | Money & Banking. Term I.  |
|                              | ECO 158           | Financial Markets & Investments. Term II.                               |
|                              | ECO 173           | Economics of Organization & Management. Term I.                         |
|                              | ECO 181           | Corporate Finance. Term I.  |
|                              | ECO 187           | Public Finance. Term I.   |
|                              | MS 120            | Managerial Effectiveness. Term II.                                      |
|                              | MS 161            | Marketing Management. Term I.   |
|                              | SOC 155           | Organizations & Management. Term I.                                     |
| ABOUT CHILDREN               | EDU 108S          | Teaching Practices in Elementary Language Arts & Content Areas. Term I. |
|                              | EDU 121           | Infant/Early Childhood Education Programs. Term I.                      |
|                              | EDU 149S          | Exceptional Children. Term I.   |
|                              | LIT 020S          | American Fairy Tales. Term II.  |
|                              | PSY 097           | Developmental Psychology. Term II.                                      |
|                              | PSY 119A          | Abnormal Psychology. Terms I & II.                                      |
|                              | PSY 137           | Adolescence. Term I.  |
|                              | PSY 170P          | Family Psychology. Term II.   |
| FILM/MEDIA                   | EDU 211           | Education & the Mass Media. Term I.                                     |
|                              | LIT 020S          | Film, Television, & the Body. Term II.                                  |
|                              | LIT 020S          | Rethinking Rock & Roll. Term I.   |
|                              | LIT 116           | Film History: Silent Film. Term II.                                     |
| GENDER/SEXUALITY/ABOUT WOMEN | ENG 170           | Gender & Race in 20th-Century American Fiction. Term II.                |
|                              | FR 159            | The French Love Story. Term II.   |
|                              | HST 106S          | The Civil War Reconsidered. Term I.                                     |
|                              | HST 196S          | History of Sexuality in America. Term II.                               |

|                       |             |   |
|-----------------------|-------------|---|
|                       | LIT 123     | Sexual Politics: The Question of Pleasure. Term I.      |
|                       | PHL 196S    | Philosophy & Feminism. Term II.                         |
|                       | WST 060     | Gender, Social Policy, & Politics. Term II.             |
|                       | WST 103     | Introduction to Women's Studies. Term I.                |
| MODERN DAY CHALLENGES | BIO 043D    | Ecology and Society. Term II.                           |
|                       | ECO 199     | Distributive Justice & the Social Sciences. Term I.     |
|                       | EDU 209     | Global Education. Term II.                              |
|                       | ENG 169S    | Frost & Eliot. Term I.                                  |
|                       | HST 101C    | Terrorism, 1848-1968. Term I.                           |
|                       | HST 120/239 | Socialism & Communism. Term I.                          |
|                       | HST 123S    | Madness & Society. Term I.                              |
|                       | PHL 196S    | Environmental Ethics. Term I.                           |
|                       | REL 185     | Ethics and the Internet. Term I.                        |
|                       | SOC 011     | Contemporary Social Problems. Term II.                  |
|                       | UWC 117S    | The Contemporary Essay. Term II.                        |
| SELF-EXPLORATION      | CA 141      | Self and Society. Term I.                               |
|                       | CA 180S     | Anthropology & American Culture. Term II.               |
|                       | CS 117      | Ancient Myth in Literature. Term I.                     |
|                       | CS 180      | Magic & Superstition in the Ancient World. Term I & II. |
|                       | EDU 117     | Personal & Social Adjustment. Term I.                   |
|                       | EDU 140     | Psychology of Work. Term I.                             |
|                       | ENG 155     | Contemporary American Writers. Term I.                  |
|                       | PSY 109A    | Health Psychology. Term I.                              |
|                       | REL 148     | Alternative Religion in America. Term I.                |
| SPORT                 | PE 170      | History & Issues of Sports. Term I.                     |
|                       | PE 172      | Administration in Sports Management. Term I & II.       |
|                       | PE 174      | Sports Marketing of Collegiate Athletic Events. Term I. |
|                       | SOC 153     | Sport & Society. Term I.                                |
|                       |             |   |

## Study Abroad

The Duke University Office of Foreign Academic Programs, in cooperation with several University departments, provides opportunities for students to study abroad while earning Duke University credit. Applications from non-Duke students are welcome. Further information about these programs can be obtained from the program directors or from the Office of Foreign Academic Programs, 121 Allen Building, Duke University, Box 90057, Durham, NC 27708-0057. (919/684-2174; Fax 919/684-3083; E-mail: [abroad@asdean.duke.edu](mailto:abroad@asdean.duke.edu))

**Australia, Sydney** (June 19-August 1). This two-course, six-week program focuses on the biogeography and environmental history of Australia. The program is based at The University of New South Wales in Sydney, with the first week spent in the Northern Territories and the final week spent in Queensland at the university's research facility at Lady Elliott Island on the Great Barrier Reef and in tropical rain forests near Cairns. The first course is *BIO 101: Biogeography in an Australian Context* (NS) taught by Professor Richard Searles of Duke University. The second course is an advanced level history course on history, development and environment, taught by a professor of The University of New South Wales. Students live in dormitory-style accommodations. For further information, contact Professor Richard Searles, Department of Botany, 147 Biological Sciences Building, Box 90338, Durham, NC 27708-0338 (919/660-7340; E-mail: [searles@acpub.duke.edu](mailto:searles@acpub.duke.edu)) or the Office of Foreign Academic Programs.

**Canada** (Two sessions: May 5-June 13; July 2-August 12). These two six-week sessions provide a complete immersion in French. Students are placed in one of nine levels of language instruction in each of the sessions. Upon return they are tested and then placed in the appropriate Duke level if they intend to continue with French language studies at Duke. Instruction and accommodations are provided by the University of Quebec, Trois Rivières campus. For further information, contact Janice Engelhardt, Canadian Studies Program, 2016 Campus Drive, Box 90422, Durham, NC 27708-0422 (919/684-4260; E-mail: [jae4@acpub.duke.edu](mailto:jae4@acpub.duke.edu)) or the Office of Foreign Academic Programs.

**Flanders and the Netherlands** (July 10-August 21). This two-course, six-week program offers a contextual study of late medieval to early modern Netherlandish art and visual culture. The double course: *ART 158-159* or *ART 241-242: History of Netherlandish Art and Visual Culture in a European Context* (AL) (2 cc) (cross-listed with Comparative Area Studies/ Medieval and Renaissance Studies) is taught by the Duke program director, Professor Hans J. Van Miegroet, with distinguished Dutch and Flemish guest professors. This interactive program is based the first two weeks in Amsterdam and Utrecht (The Netherlands), and the next four in Ghent (Flanders). Participants explore numerous Dutch and Belgian cities, collections, museums and sites. Accommodations are in hotels, where faculty also reside to improve student-faculty interaction. For further information, contact Professor Hans J. Van Miegroet, Department of Art and Art History, 114 East Duke Building, Box 90764, Durham, NC 27708-0764 (919/684-2499; E-mail: [hvm@acpub.duke.edu](mailto:hvm@acpub.duke.edu)) or the Office of Foreign Academic Programs.

**France, Paris** (mid June-late July). This two-course, six-week program provides the opportunity to take Duke courses in the ambiance of Paris. *FR 137: Aspects of Contemporary French Culture* (CZ, FL) (cross-listed with Comparative Area Studies) is a conversation course taught by a native French speaker; the second course is taught in French by the Duke program director. Four semesters of college French or equivalent are required. Students live in dormitory-style accommodations. For further information, contact Professor Clare Tufts, Department of Romance Studies, 106 Languages Building, Box 90257, Durham, NC 27708-0257 (919/660-3100; E-mail: [ctufts@acpub.duke.edu](mailto:ctufts@acpub.duke.edu)) or the Office of Foreign Academic Programs.

**Germany, Erlangen** (May 12-June 30; or May 1-July 31) *German Language and Culture Program*. Duke offers two programs at the Friedrich-Alexander University at Erlangen-Nürnberg. One program (May 12-June 30) provides an opportunity to study

classroom German at different levels while living with a German family and participating in study, day trips, and excursions. The courses are GER 150: *Advanced Grammar Review, Composition and Current Issues* (FL); and GER 153: *Aspects of Contemporary German Culture* (CZ, FL) (cross-listed with Comparative Area Studies). Two semesters of college German or the equivalent are required. In the other program (May 1-July 31), advanced students may choose from a variety of FAU courses all taught in German and remain for a full summer semester. For further information, contact Professor Helga Bessent, Department of Germanic Languages and Literature, 116F Old Chemistry Building, Box 90256, Durham, NC 27708-0256 (919/660-3172; E-mail: hwb@acpub.duke.edu) or the Office of Foreign Academic Programs.

**Greece** (May 20-June 20). This four-week, one-course program focuses on the cultures of Greece from Neolithic to Medieval times. The course, CS 147/ART 115: *Ancient Greece* (CZ), is taught by the program director, Professor John Younger of Duke University. The course concentrates on Athens, southern Greece and the Cycladic Islands, and consists of on-site lectures at numerous sites of historical and archaeological interest. Travel in Greece is provided by private coach. Accommodations are in hotels. For further information, contact Professor John Younger, Department of Classical Studies, 228 Allen Building, Box 90103, Durham, NC 27708-0103 (919/684-2082; E-mail: jyounger@acpub.duke.edu) or the Office of Foreign Academic Programs.

**Italy, Venice** (May 31-July 11). This two-course, six-week program concentrates on Venetian civilization, culture and art history. The Duke program director, Professor Gregson Davis, teaches the first course, CS 149 (C-L: HST 100R/LIT 196): *Venetian Civilization and its Mediterranean Background* (AL, CZ). This course deals with aspects of Venetian civilization in relation to ancient Mediterranean cultures. The second course, ARH 135: *Venetian Art of the Renaissance (XVth - XVIth century)*, focuses on the painting, sculpture and architecture of the Venetian Renaissance. Both courses are taught in English. Students live in dormitories of Venice International University on San Servolo Island. For further information, contact Professor Gregson Davis, Department of Classical Studies, 234-A Allen Building, Box 90103, Durham, NC 27708-0103 (919/684-3244) or the Office of Foreign Academic Programs.

**Morocco** (mid June-late July). This two-course, six-week program offers the opportunity to study North African culture and religion in Marrakesh, Fez and at Mohammed V University in Rabat. The program is under the direction of Professor Vincent Cornell of Duke. The courses are ARB 100 (CST/AAS 103): *North African Culture* (AL); and REL 143 (C-L: AAS 164/CST/HST 187/IDC 164): *History and Religions of North Africa* (CZ). Both courses are taught in English. Field trips are part of the courses. Accommodations are in four-star hotels. For further information contact Professor Vincent Cornell, Department of Religion, 115 Gray Building, Box 90964, Durham, NC 27708-0964 (919/660-3502; E-mail: vmansur@acpub.duke.edu) or the Office of Foreign Academic Programs.

**Russian Republic, St. Petersburg** (May 10-July 1). This seven-week program offers two Russian language and culture courses in St. Petersburg. Russian language study at different levels is available. Classes in St. Petersburg are taught at the University of St. Petersburg by faculty members of the University. Prerequisite: a minimum of two semesters of college level Russian is suggested. Students are housed in an apartment hotel or with families. For further information, contact the program director Professor Edna Andrews, Department of Slavic Languages and Literatures, 314 Languages Building, Box 90259, Durham, NC 27708-0259 (919/660-3140; E-mail: eda@acpub.duke.edu) or the Office of Foreign Academic Programs.

**Spain** (May 23-July 4). This two-course, six-week program in Seville (2 weeks) and Madrid (4 weeks) offers advanced Spanish students further language training as well as the opportunity to study Spanish culture, history and politics. Participants can choose



two of the following courses: SP 131: *Spain, Yesterday and Today* (CZ, FL); SP 137: *Art and Civilization* (CZ, FL); SP 141S: *Literature and the Performing Arts* (AL, FL); PS 117: *Political System of Spain* (SS); ECO 060: *Economics of a United Europe*; and SP 191: *Independent Study*. (SP 131 and SP 137 are cross-listed with Comparative Area Studies.) The program is notably rich in its field trips, including visits to Barcelona, Córdoba, Granada, Segovia, and Toledo. Prerequisites: four semesters of college-level Spanish or equivalent. All courses are conducted in Spanish and students live with Spanish families. For further information contact Professor Miguel Garci-Gómez, Department of Romance Studies, 205 Languages Building, Box 90257, Durham, NC 27708-0257 (919/660-3111; E-mail: garci@acpub.duke.edu) or the Office of Foreign Academic Programs.

**United Kingdom, Cambridge** (June 27-August 7). This two-course program focuses on the interrelations between fiction, religion and the changing cultural climate in England from the close of the Victorian period until the present day. One course, REL 185.01 (AL, CZ), deals with the theology and fiction of C.S. Lewis; the other course, REL 187/ENG 132B (AL), treats belief and the language of place, environment and space in modern English fiction. Both courses are taught by the Duke program director, Professor Wesley Kort, and British guest lecturers. Accommodations are at Westcott House, one of the theological colleges of Cambridge University. Excursions are part of the curriculum. For further information, contact Professor Wesley Kort, Department of Religion, 328 Gray Building, Box 90964, Durham, NC 27708-0964 (919/660-3519; E-mail: wkort@acpub.duke.edu) or the Office of Foreign Academic Programs.

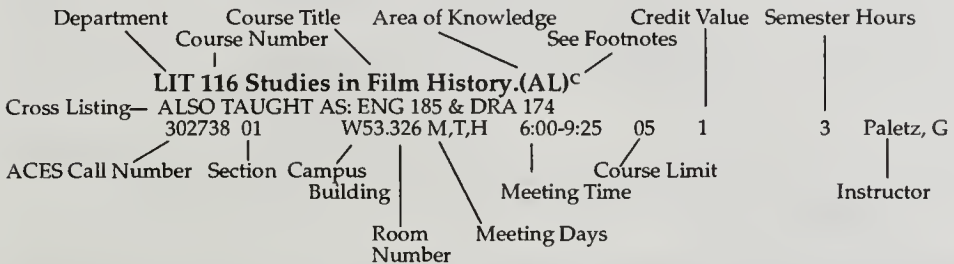
**United Kingdom, London-Drama** (June 25-August 6). This two-course, six-week program offers the opportunity to study drama in performance through seeing over twenty performances of a variety of plays, classic and new, and musicals in London and Stratford-upon-Avon. The courses are DRA 117S/ENG 176BS: *Theater in London: Text* (AL) and DRA 138S/ENG 176CS: *Theater in London: Text and Performance* (AL). Daily classes are taught by Professor John Clum of Duke and a variety of well-known British actors, writers, and directors. The program is designed to meet the needs of both the novice with an interest in theater and the drama major. Accommodations are in a dormitory of University College, London. For further information, contact Professor John Clum, Drama Program, 212 Bivins Building, Box 90680, Durham, NC 27708-0680 (919/660-3350; E-mail: jclum@acpub.duke.edu) or the Office of Foreign Academic Programs.

**United Kingdom, Oxford** (July 4-August 15). This six-week session at New College, Oxford, utilizes the Oxford tutorial system of education supplemented by lectures given at the University of Oxford's International Graduate Summer School by noted British scholars. Courses may include: *Nineteenth Century British Literature*; *Shakespeare*; *Modern British History*; *Politics and Government in Britain since 1945*; and *Law: Personal Injuries in the United Kingdom and the United States*. For further information, contact Professor Melissa Malouf, Department of English, 012 Social Sciences, Box 90015, Durham, NC 27708-0719 (919/684-5399; E-mail: mmalouf@acpub.duke.edu) or the Office of Foreign Academic Programs.

*In addition to the above programs the Office of Foreign Academic Programs is seeking approval to offer a six week two-course program in summer 1998 in Havana, Cuba. The program will focus on Cuban Culture and Caribbean Literature. For further information contact the Office of Foreign Academic Programs.*

## Abbreviations and Footnotes

### Listing Explanation:



**TBA**—Class time and meeting place to be arranged. It is the responsibility of the student to contact the professor or the departmental office no later than the first day of class for a given term for specific information.

**Area of Knowledge** codes (AL, CZ, FL, NS, QR, SS) appear between course titles and footnotes. (These codes are not necessarily relevant for non-Duke students.)

Arts and Literatures (AL)  
 Civilizations (CZ)  
 Foreign Languages (FL)

Natural Sciences (NS)  
 Quantitative Reasoning (QR)  
 Social Sciences (SS)

**Buildings:** (Please see maps on pages 62-64.)

### East Campus

|                 |                       |
|-----------------|-----------------------|
| EA West Duke    | EI Ark                |
| EB Carr         | EJ Gymnasium          |
| EC Museum       | EK Lilly Library      |
| ED East Duke    | EP Baldwin Auditorium |
| EE Biddle Music | ER East Campus Union  |
| EF Bivins       | ES The Bishop's House |
| EH Art          |                       |

### West Campus (W)

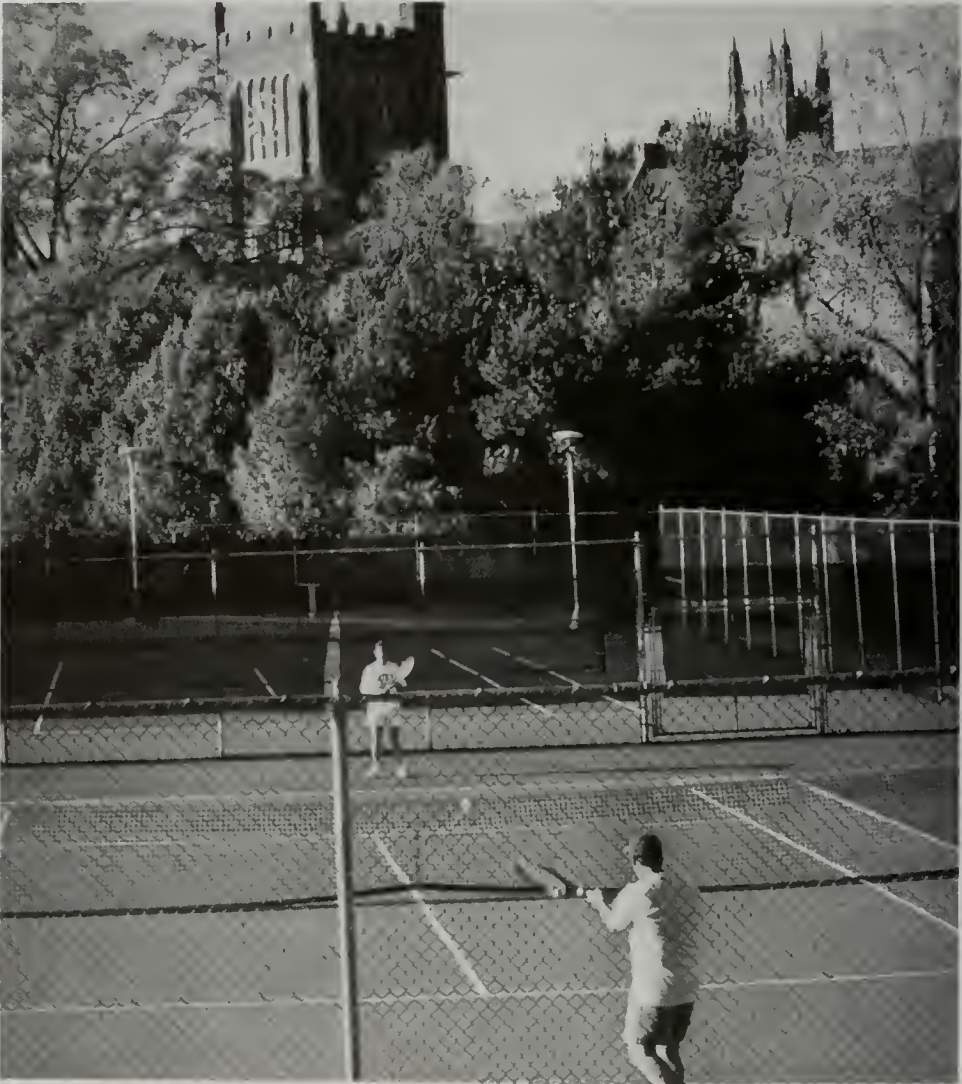
|                         |                                    |                            |
|-------------------------|------------------------------------|----------------------------|
| W1 Chapel               | W24 International Studies Center   | W65 Gross Chemical Lab     |
| W3 Gray                 | W25 Sanford Institute              | W66 Teer                   |
| W4 Perkins Library      | W35 Canadian Studies               | W76 Levine Research Center |
| W5 Foreign Languages    | W36 Asian / African Languages      |                            |
| W6 Old Chemistry        | W47 Hudson Hall                    |                            |
| W7 Divinity             | W48 Ctr. for Engineering Education |                            |
| W9 Sociology-Psychology | W49 Physics                        |                            |
| W10 Social Sciences     | W53 Allen                          |                            |
| W14 Union Building      | W56 North                          |                            |
| W17 Card Gymnasium      | W58 Biological Sciences            |                            |

### Medical Center

|                      |                                       |
|----------------------|---------------------------------------|
| MDN Davison          | MNB Bryan Research Building           |
| MJN Jones            | MSN School of Nursing                 |
| MMB Sands            | MSR Medical Science Research Building |
| MMS Nanaline H. Duke |                                       |

Footnotes. Some courses are shown in the schedule with a footnote for specific restrictions or information. Please remember that you are responsible for knowing these requirements when you register.

- |  |   |
|--|---|
| A Permission number required to register     | Q Fee payable in class                                |
| B Majors only                                | R Check for additional times                          |
| C Cross-listed in another department         | T Skills Course                                       |
| D Graduate/professional students only        | U Junior and/or Senior only                           |
| E Course has lab                             | V Language Requirement course                         |
| F Course has lab and recitation              | X Apply to Marine Lab-Beaufort, NC                    |
| I Course has a lecture                       | 2 Also offered for Summer                             |
| J Additional fee required                    | 3 See pages 26-28 for description of foreign programs |
| L Pass/fail only                             | \$ School of the Environment students only            |
| M First-year students and/or sophomores only | + Graduate students and seniors                       |
| P Check prerequisite                         |   |



## Schedule of Classes

**Class Meetings.** Summer Session classes meet Monday through Friday each week, except for evening classes (beginning at 5:00 p.m.) which meet on Monday, Tuesday, and Thursday. The beginnings and endings of all courses coincide with the regular term unless special dates are given in our schedule. Classes meet either for twenty-eight (daytime) or seventeen (evening) days, for a total of 35 hours or more. There is a one-day reading period before final exams.

| Period | Time             | Period | Time             | Period | Time           |
|--------|------------------|--------|------------------|--------|----------------|
| 1      | 8:00-9:15 a.m.   | 4      | 12:30-1 :45 p.m. | 7      | 5:00-7:05 p.m. |
| 2      | 9:30-10:45 a.m.  | 5      | 2:00-3:15 p.m.   | 8      | 6:00-8:05 p.m. |
| 3      | 11:00-12:15 p.m. | 6      | 3:30-4:45 p.m.   | 9      | 7:20-9:25 p.m. |

## Final Examination Schedule

|           |           |   |
|-----------|-----------|---|
| July 1    | Wednesday | Term I Final Examinations begin.        |
|           |           | <b>Period:</b> <b>Examination time:</b> |
|           |           | 1 9:00 a.m.-12:00 noon                  |
|           |           | 3 2:00 p.m.-5:00 p.m.                   |
|           |           | 4, 7, 8 7:00 p.m. - 10:00 p.m.          |
| July 2    | Thursday  | Term I Final Examinations continue.     |
|           |           | <b>Period:</b> <b>Examination time:</b> |
|           |           | 2 9:00 a.m. - 12:00 noon                |
|           |           | 5 2:00 p.m. - 5:00 p.m.                 |
|           |           | 6, 9 7:00 p.m. - 10:00 p.m.             |
| August 14 | Friday    | Term II Final Examinations begin.       |
|           |           | <b>Period:</b> <b>Examination time:</b> |
|           |           | 1 9:00 a.m. - 12:00 noon                |
|           |           | 3 2:00 p.m. - 5:00 p.m.                 |
|           |           | 4, 7, 8 7:00 p.m. - 10:00 p.m.          |
| August 15 | Saturday  | Term II Final Examinations continue.    |
|           |           | <b>Period:</b> <b>Examination time:</b> |
|           |           | 2 9:00 a.m. - 12:00 noon                |
|           |           | 5 2:00 p.m. - 5:00 p.m.                 |
|           |           | 6, 9 7:00 p.m. - 10:00 p.m.             |

No hour examination may be given within the last three days before the final examination period. Any deviation from this examination schedule must be approved by the director of the Summer Session.



## Summer Term I May 21—July 2

### ARABIC

ARB 001 Elementary Arabic.(FL)<sup>TI</sup> 1 3  
200008 01 W36. M-F 11:00-12:15 20 CHERGUI, A

### ART HISTORY

ARH 070 Introduction to the History  
of Art.(AL) 1 3  
200015 01 W10.139 M-F 11:00-12:15 40 HOUGHTON, C M G

ARH 189 Modern and Postmodern  
Architecture.(AL) 1 3  
200022 01 W10.139 M-F 9:30-10:45 30 STAFF

### ASIAN & AFRICAN LANGUAGES/ LITERATURE

AAL 165S Modern Arabic Literature  
in Translation.(AL) 1 3  
200001 01 W36. MTH 6:00- 8:05 15 CHERGUI, A

### BIOCHEMISTRY

BCH 209 Independent Study.<sup>A</sup> var var  
200064 01 TBA 10 STAFF  
200071 02 TBA 10 FIERKE, C A

BCH 210 Independent Study.<sup>A</sup> var var  
200078 01 TBA 10 STAFF  
200085 02 TBA 10 HSIEH, T-S  
200092 03 TBA 10 GREENLEAF, A L  
200099 04 TBA 10 LEFKOWITZ, R J

### BIOLOGICAL ANTHROPOLOGY & ANATOMY

BAA 093 Introduction to Biological  
Anthropology.(NS) 1 3  
200050 01 W58.113 M-F 12:30- 1:45 30 MERRILL, M Y

BAA 132 Human Evolution.(NS)<sup>P</sup> 1 3  
200057 01 W58.113 M-F 9:30-10:45 18 WOOD, K D

### BIOLOGY

BIO 010L Marine Biology.(NS)<sup>PX</sup> 1 4  
200106 01 TBA 20 KENNY, B E

BIO 101 Biogeography in an Australian  
Context.(NS) 1 3  
200113 01 TBA 40 DUKE-AUSTRALIA

BIO 114L Biological  
Oceanography.(NS)<sup>PX</sup> 1.5 6  
200120 01 TBA 20 CAHOON, L B

BIO 118 Principles of Genetics  
and Cell Biology I.(NS)<sup>P</sup> 1 3  
200127 01 W58.113 M-F 3:30-5:00 30 GRUNWALD, R

BIO 150L Physiology of Marine  
Animals.(NS)<sup>PX</sup> 1.5 6  
200134 01 TBA 18 FORWARD, R B

BIO 155L Biochemistry of Marine  
Animals.(NS)<sup>PX</sup> 1.5 6  
200141 01 TBA 18 RITTSCHOF, D

BIO 176L Marine Invertebrate  
Zoology.(NS)<sup>PX</sup> 1.5 6  
200148 01 TBA 20 KIRBY-SMITH, W

BIO 191 Independent Study.<sup>AX</sup> 1 3  
200155 01 TBA 10 STAFF  
200162 08 TBA 10 FORWARD, R B

BIO 192 Independent Study.<sup>A</sup> 1 3  
200169 08 TBA 10 FORWARD, R B

BIO 193T Tutorial.<sup>AUX</sup> 1 3  
200176 01 TBA 10 STAFF

BIO 194T Tutorial.<sup>AUX</sup> 1 3  
200183 01 TBA 10 STAFF

### BIOMEDICAL ENGINEERING

BME 191 Projects in Biomedical  
Engineering.<sup>AU</sup> var var  
200190 01 TBA 10 STAFF

BME 192 Projects in Biomedical  
Engineering.<sup>AU</sup> var var  
200197 01 TBA 10 STAFF

BME 265 Advanced Topics in Biomedical  
Engineering.<sup>A</sup> 1 var  
200204 01 TBA 10 STAFF

BME 399 Special Readings in Biomedical  
Engineering.<sup>AD</sup> var  
200211 01 TBA 10 STAFF

### BOTANY

BOT 224T Special Problems.<sup>ADX</sup> var  
200218 01 TBA 40 STAFF  
200225 13 TBA 05 KOHORN, B D  
200232 58 TBA 05 DONG, X

### CELL BIOLOGY

CBI 210 Independent Study.<sup>A2</sup> var var  
200246 01 TBA 10 GARRETT, W E  
200253 02 TBA 10 SCHACHAT, F J  
200260 05 TBA 10 BONAVENTURA, C  
200267 16 TBA 10 GARRETT, W E

CBI 244L Molecular and Cellular Processes in  
Marine Organisms.<sup>CEPX</sup> 1 4  
ALSO TAUGHT AS: ENV 244L  
200274 01 TBA 10 MCCLELLAN-GREEN

### CHEMISTRY

CHM 011L Principles of Chemistry.(NS)<sup>FP</sup> 1 4  
200309 01 W65.110 M-F 11:00-12:15 20 DUBAY, G R  
W65.204 TH 1:15- 5:15 20 DUBAY, G R

CHM 151L Organic Chemistry.(NS)<sup>P</sup> 1 4  
200316 01 W65.107 M-F 11:00-12:15 90 MONTAGUE-5MITH  
W65.226 TH 1:15- 5:15 90 MONTAGUE-5MITH

### CIVIL ENGINEERING

CE 141 Special Topics in  
Civil Engineering.<sup>A</sup> var var  
200281 01 TBA 10 STAFF

CE 197 Projects in Civil Engineering.<sup>AU</sup> var var  
200288 01 TBA 10 STAFF

CE 265 Advanced Topics in Civil  
and Environmental Engineering. var  
200295 01 TBA 10 STAFF

CE 399 Special Readings in Civil  
and Environmental Engineering.<sup>AD</sup> var  
200302 01 TBA 18 STAFF

# REGISTRATION FORM

To be completed by:

**Non-Duke Students/Visitors  
Graduating Duke Seniors  
Incoming Duke First Year Students**

Return completed  
registration form to:

Summer Session Office  
Box 90059  
Duke University  
Durham, NC 27708-0059  
or FAX: (919) 681-8235

**Non-Duke student:** ☐ Pre-baccalaureate or ☐ Post-baccalaureate

Have you previously attended Duke?

☐ No ☐ Yes, date(s) \_\_\_\_\_

Have you received a degree from Duke?

☐ No ☐ Yes  
if yes, date and type of degree \_\_\_\_\_

**Duke student:** ☐ Graduating Duke Senior ☐ Incoming Duke First Year Student

☐ Ms. ☐ Mr. ☐ Dr. \_\_\_\_\_  
first middle initial last name

Social Security Number: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_

Date of Birth: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_

**Mailing Address:** \_\_\_\_\_  
street city state zip code

Tel: ( \_\_\_\_\_ ) \_\_\_\_\_ Fax: ( \_\_\_\_\_ ) \_\_\_\_\_

e-mail address: \_\_\_\_\_

**Permanent Address:** \_\_\_\_\_  
street city state zip code

Tel: ( \_\_\_\_\_ ) \_\_\_\_\_

I am registering for the following courses:

| Term I  | Department Abbreviation | Course No. (incl. suffix) | Course Section | Course Credits(cc) | Semester Hours (sh) | ✓ For Audit (not for credit) |
|---------|-------------------------|---------------------------|----------------|--------------------|---------------------|------------------------------|
|         |                         |                           |                |                    |                     |                              |
|         |                         |                           |                |                    |                     |                              |
|         |                         |                           |                |                    |                     |                              |
| Term II | Department Abbreviation | Course No. (incl. suffix) | Course Section | Course Credits(cc) | Semester Hours (sh) | ✓ For Audit (not for credit) |
|         |                         |                           |                |                    |                     |                              |
|         |                         |                           |                |                    |                     |                              |
|         |                         |                           |                |                    |                     |                              |

Instructor's permission/signature (for Audits only):

(over)

Signature

Print Name

I have read pages 8-10 of this bulletin and understand my obligations, including financial penalties I may entail by dropping, withdrawing and/or not attending the above courses for which I have now registered. I also affirm that all information on this form is complete and correct.

\_\_\_\_\_  
signature date

to be completed by Non-Duke students/Visitors only:

Name of Kin: \_\_\_\_\_  
name relation

Address: \_\_\_\_\_  
street city state zip code

Tel: (     )     Fax: (     )

e-mail address: \_\_\_\_\_

**Are you at present a college student?**

☐ Yes (name, city, and state of the institution): \_\_\_\_\_

Are you a candidate for a degree? ☐ no ☐ yes, type: \_\_\_\_\_

expected date of graduation? \_\_\_\_\_

Are you on any type of academic or disciplinary probation at the above institution? ☐ no ☐ yes  
if yes, explain: \_\_\_\_\_

\_\_\_\_\_

☐ No

**If you are not presently enrolled, have you attended college in the past?**

☐ Yes, highest degree held: \_\_\_\_\_

Name(s) and address(es) of college(s) and date(s) attended:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Were you on any type of academic or disciplinary probation at the time you left any of the above institutions?

☐ No

☐ Yes If yes, explain: \_\_\_\_\_  
\_\_\_\_\_

☐ No

I have been accepted to begin my college education this fall at \_\_\_\_\_  
\_\_\_\_\_. Please attach a copy of your admissions offer.

**Thank you.**

### CLASSICAL STUDIES

|  |          |          |
|--|----------|----------|
| <b>CS 011S Greek Civilization.(CZ)</b>                     | <b>1</b> | <b>3</b> |
| 200330 01 W53.234 M-F 9:30-10:45 15 OLSEN, B A             |          |          |
| <b>CS 117 Ancient Myth in Literature.(AL)</b>              | <b>1</b> | <b>3</b> |
| 200337 01 W53.234 M-F 11:00-12:15 15 PRINCE, M D           |          |          |
| <b>CS 180 Magic and Superstition in the Ancient World.</b> | <b>1</b> | <b>3</b> |
| 200344 01 W53.234 MTH 7:20- 9:25 20 BERNSTEIN, N W         |          |          |

### COMPUTER SCIENCE

|   |          |          |
|---|----------|----------|
| <b>CPS 006 Introduction to Program Design and Analysis I.(QR)</b> | <b>1</b> | <b>3</b> |
| 200323 01 W76.D106 M-F 9:00-10:15 25 RAMM, D                      |          |          |
| W66.106 TH 10:20-11:30 25 RAMM, D                                 |          |          |

### CONTINUATION

|                             |     |       |
|-----------------------------|-----|-------|
| <b>CTN 001 CONTINUATION</b> |     |       |
| 200358 01 TBA               | 900 | STAFF |

### CULTURAL ANTHROPOLOGY

|  |          |          |
|--|----------|----------|
| <b>CA 180S Cultures of Business and Science.(SS)</b> | <b>1</b> | <b>3</b> |
| 200239 01 W10.124 MTH 6:00- 8:05 15 FRIEDMAN, J R    |          |          |

### DRAMA

|  |          |          |
|--|----------|----------|
| <b>DRA 099S Introduction to Performance.(AL)</b> | <b>3</b> |          |
| 200365 01 EG. M-F 3:30- 4:45 14 STORER, J M      |          |          |
| <b>DRA 131S Acting.(AL)<sup>A</sup></b>          | <b>1</b> | <b>3</b> |
| 200372 01 EG. M-F 2:00- 3:15 15 STORER, J M      |          |          |
| <b>DRA 183 Shakespeare.(AL)<sup>C</sup></b>      | <b>1</b> | <b>3</b> |
| ALSO TAUGHT AS: ENG 144                          |          |          |
| 200379 01 W53.318 M-F 11:00-12:15 05 BECKWITH, S |          |          |

### ECONOMICS

|  |          |          |
|--|----------|----------|
| <b>ECO 051D National Income and Public Policy.(SS)<sup>R</sup></b>       | <b>1</b> | <b>3</b> |
| 200386 01 W10.229 M-F 9:30-10:45 30 PAUL, D                              |          |          |
| <b>ECO 052D Competition, Monopoly, and Welfare.(SS)</b>                  | <b>1</b> | <b>3</b> |
| 200393 01 W10.229 M-F 11:00-12:15 40 GILBERT, J L                        |          |          |
| <b>ECO 083 Financial Accounting and Decision Making.(SS)</b>             | <b>1</b> | <b>3</b> |
| 200400 01 W10.111 MTH 5:00- 7:05 35 SKENDER, C J                         |          |          |
| <b>ECO 139 Introduction to Econometrics.(QR)<sup>P</sup></b>             | <b>1</b> | <b>3</b> |
| 200407 01 W10.111 M-F 11:00-12:15 15 SHEN, Y                             |          |          |
| <b>ECO 149 Microeconomics.(SS)<sup>P</sup></b>                           | <b>1</b> | <b>3</b> |
| 200414 01 W10.213 M-F 11:00-12:15 30 KIMBROUGH, K P                      |          |          |
| <b>ECO 153 Money and Banking.(SS)<sup>P</sup></b>                        | <b>1</b> | <b>3</b> |
| 200421 01 W10.224 M-F 9:30-10:45 15 YOHE, W P                            |          |          |
| <b>ECO 154 Macroeconomics.(SS)<sup>P</sup></b>                           | <b>1</b> | <b>3</b> |
| 200428 01 W10.213 M-F 9:30-10:45 20 KIMBROUGH, K P                       |          |          |
| <b>ECO 158 Financial Markets and Investments.(SS)<sup>P</sup></b>        | <b>1</b> | <b>3</b> |
| 200435 01 W10.327 M-F 9:30-10:45 25 AUSTIN, A M                          |          |          |
| <b>ECO 173 Economics of Organization and Management.(SS)<sup>P</sup></b> | <b>1</b> | <b>3</b> |
| 200442 01 W10.225 M-F 9:30-10:45 20 KIRGIZ, K A                          |          |          |
| <b>ECO 181 Corporate Finance.(SS)<sup>P</sup></b>                        | <b>1</b> | <b>3</b> |
| 200449 01 W10.229 M-F 12:30- 1:45 20 ZHANG, B                            |          |          |

|   |          |          |
|---|----------|----------|
| <b>ECO 187 Public Finance.(SS)<sup>P</sup></b>                                | <b>1</b> | <b>3</b> |
| 200456 01 W10.111 M-F 9:30-10:45 20 ATALLAH, J S                              |          |          |
| <b>ECO 199 Distributive Justice and the Social Sciences.(SS)<sup>CP</sup></b> | <b>1</b> | <b>3</b> |
| ALSO TAUGHT AS: PS 175A   |          |          |
| 200463 01 W10.225 M-F 11:00-12:15 14 ZHOU, W                                  |          |          |
| <b>ECO 239 Introduction to Econometrics.(QR)<sup>P</sup></b>                  | <b>1</b> | <b>3</b> |
| 200470 01 W10.111 M-F 11:00-12:15 05 SHEN, Y                                  |          |          |
| <b>ECO 249 Microeconomics.(SS)</b>  | <b>1</b> | <b>3</b> |
| 200477 01 W10.213 M-F 11:00-12:15 05 KIMBROUGH, K P                           |          |          |
| <b>ECO 254 Macroeconomics.(SS)</b>  | <b>1</b> | <b>3</b> |
| 200484 01 W10.213 M-F 9:30-10:45 05 KIMBROUGH, K P                            |          |          |

### EDUCATION

|   |          |          |
|---|----------|----------|
| <b>EDU 100 Social and Philosophical Foundations of Education.(SS)</b>                 | <b>1</b> | <b>3</b> |
| 200491 01 W3.228 M-F 9:30-10:45 40 DI BONA, J E                                       |          |          |
| <b>EDU 108S Teaching Practices in Elementary Language Arts and Content Areas.(SS)</b> | <b>1</b> | <b>3</b> |
| 200498 01 W4.421 TH 5:00- 8:10 15 RIGGSBEE, J J                                       |          |          |
| <b>EDU 117S Psychology of Personal and Social Adjustment.(SS)</b>                     | <b>1</b> | <b>3</b> |
| 200505 01 W10.232 M-F 12:30- 1:45 15 MALONE, D M                                      |          |          |
| <b>EDU 118 Educational Psychology.(SS)</b>  | <b>1</b> | <b>3</b> |
| 200512 01 W10.111 M-F 2:00- 3:15 25 MALONE, D M                                       |          |          |
| <b>EDU 121 Infancy, Early Childhood, and Educational Programs.(SS)</b>                | <b>1</b> | <b>3</b> |
| 200519 01 W10.224 M-F 3:30- 4:45 15 RIGGSBEE, J J                                     |          |          |
| <b>EDU 140 The Psychology of Work.(SS)</b>  | <b>1</b> | <b>3</b> |
| 200526 01 W10.229 MTH 5:00- 7:05 20 BALLANTYNE, R H                                   |          |          |
| <b>EDU 149S Exceptional Children.(SS)</b>   | <b>1</b> | <b>3</b> |
| 200533 01 W10.232 M-F 11:00-12:15 10 DAVIS, L T                                       |          |          |
| <b>EDU 211 Education and the Mass Media.(SS)</b>                                      | <b>1</b> | <b>3</b> |
| 200540 01 W10.224 M-F 11:00-12:15 25 DI BONA, J E                                     |          |          |

### ELECTRICAL ENGINEERING

|  |            |             |
|--|------------|-------------|
| <b>EE 061L Introduction to Electric Circuits.<sup>EP</sup></b>               | <b>1</b>   | <b>4</b>    |
| 200547 01 W47.216 M-F 11:00-12:15 34 YBARRA, G A                             |            |             |
| W47.216 TH 2:00- 4:45 34 YBARRA, G A   |            |             |
| <b>EE 152L Introduction to Computer Architecture.<sup>EP</sup></b>           | <b>1</b>   | <b>4</b>    |
| 200554 01 W47.209 M-F 3:30- 4:45 10 MARINOS, P                               |            |             |
| <b>EE 163L Introduction to Electronics: Integrated Circuits.<sup>P</sup></b> | <b>1</b>   | <b>3</b>    |
| 200561 01 W47.208 M-F 11:00-12:15 40 GEORGE, R T                             |            |             |
| W47.208 TH 2:00- 4:45 40 GEORGE, R T   |            |             |
| <b>EE 164L Electronic Design Projects.<sup>P</sup></b>                       | <b>1</b>   | <b>3</b>    |
| 200568 01 TBA  | 10         | GEORGE, R T |
| <b>EE 181 Fundamentals of Signal Processing and Communications.</b>          | <b>1</b>   | <b>3</b>    |
| 200575 01 W47.216 M-F 9:30-10:45 20 NOLTE, L                                 |            |             |
| <b>EE 191 Undergraduate Research in Electrical Engineering.<sup>AU</sup></b> | <b>var</b> | <b>var</b>  |
| 200582 03 TBA  | 10         | YBARRA, G A |
| <b>EE 195 Special Topics in Electrical Engineering.<sup>A</sup></b>          | <b>var</b> | <b>var</b>  |
| 200589 01 TBA  | 10         | STAFF       |
| <b>EE 196 Special Topics in Electrical Engineering.<sup>A</sup></b>          | <b>var</b> | <b>var</b>  |
| 200596 01 TBA  | 10         | STAFF       |



## EE 197 Projects in Electrical

Engineering, AU var  
200603 01 TBA 10 GELENBE, E D

## EE 299 Advanced Topics in Electrical

Engineering, A 1 var  
200610 01 TBA 10 GELENBE, E D  
200617 02 TBA 10 GELENBE, E D  
200624 03 TBA 03 STAFF  
200631 04 TBA 02 FAIR, R B

## EE 399 Special Readings in Electrical

Engineering, AD var  
200638 01 TBA 10 GELENBE, E D

## ENGINEERING

## EGR 123L Dynamics. EP 1 4

200645 01 W47.232 M-F 9:30-10:45 20 WRIGHT, D  
W47.232 TH 2:00-4:45 20 WRIGHT, D

## EGR 183 Projects in Engineering. A 1 3

200652 01 TBA 10 STAFF

## ENGLISH

## ENG 090S Reading Critically: Poetry, Fiction, Drama. (AL) 1 3

200659 01 W53.306 M-F 9:30-10:45 15 BECKWITH, S

## ENG 091 Reading Critically: Chaucer, Shakespeare, Milton, Pope. (AL) 1 3

200666 01 W53.326 M-F 11:00-12:15 20 JONES, B

## ENG 117A S. Advanced Composition I. CPT 1 3

ALSO TAUGHT AS: UWC 117S  
200673 01 W53.306 M-F 3:30-4:45 07 KELLOGG, D R

## ENG 144 Shakespeare. (AL) C 1 3

ALSO TAUGHT AS: DRA 183

200680 01 W53.318 M-F 11:00-12:15 20 BECKWITH, S

## ENG 154 American Literature: 1915 to 1960. (AL) 1 3

200687 01 W53.317 M-F 11:00-12:15 18 STRANDBERG, V H

## ENG 155 Contemporary American Writers. (AL) 1 3

200694 01 W53.318 M-F 12:30-1:45 25 FERRARO, T

## ENG 169S.01 Frost and Eliot. (AL) 1 3

200701 01 W53.306 M-F 2:00-3:15 15 STRANDBERG, V H

## ENG 169S.02 The Art of the American Short Story. (AL)

200708 02 W53.317 M-F 2:00-3:15 15 JONES, B

## ENG 275 American Literature since 1915. (AL) 1 3

200715 01 W53.306 M-F 11:00-12:15 07 STRANDBERG, V H

## ENVIRONMENT

## ENV 191 Independent Study. AU var var

200722 01 TBA 10 MANSFIELD, C A  
200729 04 TBA 10 FREEDMAN, J  
200736 06 TBA 10 DIGIULIO, R T  
200743 07 TBA 10 DUTROW, G F  
200750 08 TBA 10 URBAN, D  
200757 09 TBA 10 SMITH, K  
200764 10 TBA 10 HEATH, M S  
200771 11 TBA 10 SIGMON, J  
200778 13 TBA 10 KNOERR, K  
200785 14 TBA 10 KRAMER, R  
200792 15 TBA 10 MAGUIRE, L  
200799 16 TBA 10 LOBER, D  
200806 17 TBA 10 RECKHOW, K

200813 18 TBA 10 RICHARDSON, C  
200820 19 TBA 10 RICHTER, D  
200827 21 TBA 10 KATUL, G  
200834 22 TBA 10 STAMBAUGH, W G  
200841 24 TBA 10 VESILIND, A  
200848 25 TBA 10 SHARMA, N  
200855 26 TBA 10 WEAR, D  
200862 27 TBA 10 CHRISTENSEN, N  
200869 30 TBA 10 HEALY, R G  
200876 33 TBA 10 TULIS, J  
200883 34 TBA 10 OREN, R  
200890 35 TBA 10 DUBAY, G R  
200897 36 TBA 10 PILKEY, O H  
200904 39 TBA 10 TERBORGH, J W  
200911 40 TBA 10 VANDENBERG, J  
200918 44 TBA 05 BARBER, R T  
200925 45 TBA 10 BONAVENTURA, C  
200932 46 TBA 05 BONAVENTURA, J  
200939 47 TBA 05 FORWARD, R B  
200946 51 TBA 05 KIRBY-SMITH, W  
200953 52 TBA 10 LOZIER, S  
200960 53 TBA 05 RAMUS, J S  
200967 54 TBA 05 RITTSCHOF, D  
200974 58 TBA 05 ORBACH, M K  
200981 59 TBA 10 JOHNSON, J A  
200988 60 TBA 10 CROWDER, L B  
200995 61 TBA 10 READ, A J  
201002 62 TBA 10 MCCLELLAN-GREEN  
201009 63 TBA 10 ROJSTACZER, S  
201016 64 TBA 10 MIRANDA, M L  
201023 65 TBA 10 AHMANN, D M  
201030 66 TBA 10 SNOOK, L K  
201037 69 TBA 10 STOW, C  
201044 70 TBA 10 KEOHANE, R O  
201051 71 TBA 10 COOPER, S  
201058 72 TBA 10 ROMANOWICZ, E  
201065 73 TBA 10 HALPIN, P N  
201072 74 TBA 10 MERCER, D E  
201079 75 TBA 10 KASIBHATLA, P  
201086 76 TBA 10 VASUDEVAN, D

## ENV 228L Physiology of Marine Animals. CDPX 6

201093 01 TBA 18 FORWARD, R B

## ENV 229L Biochemistry of Marine Animals. DPX 6

201100 01 TBA 12 RITTSCHOF, D

## ENV 244L Molecular and Cellular Processes in Marine Organisms. CEPX 1 4

ALSO TAUGHT AS: CBI 244L

201107 01 TBA 10 MCCLELLAN-GREEN

## ENV 292L Biological Oceanography. DPX 6

201114 01 TBA 20 CAHOON, L B

## ENV 295L Marine Invertebrate Zoology. CDPX 1.5 6

ALSO TAUGHT AS: ZOO 274L

201121 01 TBA 20 KIRBY-SMITH, W

## ENV 299 Independent Studies and Projects. A var var

201128 01 TBA 10 MANSFIELD, C A  
201135 04 TBA 10 FREEDMAN, J A  
201142 06 TBA 10 DIGIULIO, R T  
201149 07 TBA 10 DUTROW, G F  
201156 08 TBA 10 URBAN, D L  
201163 09 TBA 10 SMITH, V K  
201170 10 TBA 10 HEATH, M S  
201177 11 TBA 10 SIGMON, J T  
201184 13 TBA 10 KNOERR, K R  
201191 14 TBA 10 KRAMER, R A  
201198 15 TBA 10 MAGUIRE, L A  
201205 16 TBA 10 LOBER, D J

|           |     |                    |
|-----------|-----|--------------------|
| 201212 17 | TBA | 10 RECKHOW, K H    |
| 201219 18 | TBA | 10 RICHARDSON, C J |
| 201226 19 | TBA | 10 RICHTER, D D    |
| 201233 21 | TBA | 10 KATUL, G G      |
| 201240 22 | TBA | 10 STAMBAUGH, W G  |
| 201247 24 | TBA | 10 VESILIND, P A   |
| 201254 25 | TBA | 10 SHARMA, N P     |
| 201261 26 | TBA | 10 WEAR, D N       |
| 201268 27 | TBA | 10 CHRISTENSEN, N  |
| 201275 30 | TBA | 10 HEALY, R G      |
| 201282 33 | TBA | 10 TULIS, J J      |
| 201289 34 | TBA | 10 OREN, R         |
| 201296 35 | TBA | 10 DUBAY, G R      |
| 201303 36 | TBA | 10 PILKEY, O H     |
| 201310 39 | TBA | 10 TERBORGH, J W   |
| 201317 40 | TBA | 10 VANDENBERG, J   |
| 201324 44 | TBA | 10 BARBER, R T     |
| 201331 45 | TBA | 10 BONAVENTURA, C  |
| 201338 46 | TBA | 10 BONAVENTURA, J  |
| 201345 47 | TBA | 10 FORWARD, R B    |
| 201352 51 | TBA | 10 KIRBY-SMITH, W  |
| 201359 52 | TBA | 10 LOZIER, M S     |
| 201366 53 | TBA | 10 RAMUS, J S      |
| 201373 54 | TBA | 10 RITTSCHOF, D    |
| 201380 58 | TBA | 10 ORBACH, M K     |
| 201387 59 | TBA | 10 JOHNSON, J A    |
| 201394 60 | TBA | 05 CROWDER, L B    |
| 201401 61 | TBA | 05 READ, A J       |
| 201408 62 | TBA | 05 MCCLELLAN-GREEN |
| 201415 63 | TBA | 05 ROJSTACZER, S   |
| 201422 64 | TBA | 05 MIRANDA, M L    |
| 201429 65 | TBA | 10 AHMANN, D M     |
| 201436 66 | TBA | 10 SNOOK, L K      |
| 201443 69 | TBA | 10 STOW, C         |
| 201450 70 | TBA | 10 KEOHANE, R O    |
| 201457 71 | TBA | 10 COOPER, S       |
| 201464 72 | TBA | 10 ROMANOWICZ, E   |
| 201471 73 | TBA | 10 HALPIN, P N     |
| 201478 74 | TBA | 10 MERCER, D E     |
| 201485 75 | TBA | 10 KASIBHATLA, P   |
| 201492 76 | TBA | 10 VASUDEVAN, D    |
| 201499 99 | TBA | 10 STAFF           |

| ENV 399 Master's Project. <sup>ADL</sup> |     | var                |
|--|-----|--------------------|
| 201506 01                                | TBA | 10 MANSFIELD, C A  |
| 201513 04                                | TBA | 10 FREEDMAN, J A   |
| 201520 06                                | TBA | 10 DI GIULIO, R T  |
| 201527 07                                | TBA | 10 DUTROW, G F     |
| 201534 08                                | TBA | 10 URBAN, D L      |
| 201541 09                                | TBA | 10 SMITH, V K      |
| 201548 10                                | TBA | 10 HEATH, M S      |
| 201555 11                                | TBA | 10 SIGMON, J T     |
| 201562 13                                | TBA | 10 KNOERR, K R     |
| 201569 14                                | TBA | 10 KRAMER, R A     |
| 201576 15                                | TBA | 10 MAGUIRE, L A    |
| 201583 16                                | TBA | 10 LOBER, D J      |
| 201590 17                                | TBA | 10 RECKHOW, K H    |
| 201597 18                                | TBA | 10 RICHARDSON, C J |
| 201604 19                                | TBA | 10 RICHTER, D D    |
| 201611 21                                | TBA | 10 KATUL, G G      |
| 201618 22                                | TBA | 10 STAMBAUGH, W G  |
| 201625 24                                | TBA | 10 VESILIND, P A   |
| 201632 25                                | TBA | 10 SHARMA, N P     |
| 201639 26                                | TBA | 10 WEAR, D N       |
| 201646 27                                | TBA | 10 CHRISTENSEN, N  |
| 201653 30                                | TBA | 10 HEALY, R G      |
| 201660 33                                | TBA | 10 TULIS, J J      |
| 201667 34                                | TBA | 10 OREN, R         |
| 201674 36                                | TBA | 10 PILKEY, O H     |
| 201681 39                                | TBA | 10 TERBORGH, J W   |
| 201688 40                                | TBA | 10 VANDENBERG, J   |
| 201695 44                                | TBA | 10 BARBER, R T     |

|           |     |                    |
|-----------|-----|--------------------|
| 201702 45 | TBA | 10 BONAVENTURA, C  |
| 201709 46 | TBA | 10 BONAVENTURA, J  |
| 201716 47 | TBA | 10 FORWARD, R B    |
| 201723 51 | TBA | 10 KIRBY-SMITH, W  |
| 201730 52 | TBA | 10 LOZIER, M S     |
| 201737 53 | TBA | 10 RAMUS, J S      |
| 201744 54 | TBA | 10 RITTSCHOF, D    |
| 201751 58 | TBA | 10 ORBACH, M K     |
| 201758 59 | TBA | 10 JOHNSON, J A    |
| 201765 60 | TBA | 10 CROWDER, L B    |
| 201772 61 | TBA | 10 READ, A J       |
| 201779 62 | TBA | 10 MCCLELLAN-GREEN |
| 201786 63 | TBA | 10 ROJSTACZER, C   |
| 201793 64 | TBA | 10 MIRANDA, M L    |
| 201800 65 | TBA | 10 AHMANN, D M     |
| 201807 66 | TBA | 10 SNOOK, L K      |
| 201814 69 | TBA | 10 STOW, C         |
| 201821 70 | TBA | 10 KEOHANE, R O    |
| 201828 71 | TBA | 10 COOPER, S       |
| 201835 72 | TBA | 10 ROMANOWICZ, E   |
| 201842 73 | TBA | 10 HALPIN, P N     |
| 201849 74 | TBA | 10 MERCER, D E     |
| 201856 75 | TBA | 10 KASIBHATLA, P   |
| 201863 76 | TBA | 10 VASUDEVAN, D    |
| 201870 99 | TBA | 10 STAFF           |

## FRENCH

|  |                     |          |
|--|---------------------|----------|
| <b>FR 001 Elementary French.(FL)<sup>T</sup></b> | <b>1</b>            | <b>3</b> |
| 201877 01 W5.207 M-F 9:30-10:45                  | 20 HEIDENREICH, B J |          |

|   |              |          |
|---|--------------|----------|
| <b>FR 063 Intermediate French.(FL)<sup>PT</sup></b> | <b>1</b>     | <b>3</b> |
| 201884 01 W5.208 M-F 9:30-10:45                     | 18 MEEKER, N |          |

## GERMAN

|  |             |          |
|--|-------------|----------|
| <b>GER 001 First-Year German: Introduction to German Language and Culture.(FL)<sup>T</sup></b> | <b>1</b>    | <b>3</b> |
| 201891 01 W5.109 M-F 9:30-10:45  | 30 EVERS, K |          |

|  |                  |          |
|--|------------------|----------|
| <b>GER 014 Intensive German.(FL)<sup>ATV</sup></b> | <b>2</b>         | <b>6</b> |
| 201898 01 W6.119 M-F 12:30- 2:55                   | 10 VILLANUEVA, D |          |

## GREEK

|   |               |          |
|---|---------------|----------|
| <b>GRK 014S Intensive Elementary Greek.(FL)<sup>t</sup></b> | <b>2</b>      | <b>6</b> |
| 201905 01 W3.220 M-F 9:00-12:00                             | 15 SOSIN, J D |          |

## HISTORY

|   |              |          |
|---|--------------|----------|
| <b>HST 101C Terrorism, 1848-1968.(CZ)</b> | <b>1</b>     | <b>3</b> |
| 201912 01 W10.111 MTH 7:20- 9:25          | 30 MILLER, M |          |

|  |                   |          |
|--|-------------------|----------|
| <b>HST 106S Seminars in Selected Topics.(CZ)</b> | <b>1</b>          | <b>3</b> |
| 201919 01 W10.219 M-F 12:30- 1:45                | 15 HARLAND-JACOBS |          |
| 201926 02 W10.219 M-F 3:30- 4:45                 | 15 BINDMAN, J A   |          |

|   |              |          |
|---|--------------|----------|
| <b>HST 110 History of Eastern Europe in Modern Times.(CZ)</b> | <b>1</b>     | <b>3</b> |
| 201933 01 W10.219 M-F 11:00-12:15                             | 09 LERNER, W |          |

|   |              |          |
|---|--------------|----------|
| <b>HST 112B The World in the Twentieth Century.(CZ)</b> | <b>1</b>     | <b>3</b> |
| 201940 01 W10.219 M-F 9:30-10:45                        | 20 CELL, J W |          |

|  |              |          |
|--|--------------|----------|
| <b>HST 120 History of Socialism and Communism.(CZ)</b> | <b>1</b>     | <b>3</b> |
| 201947 01 W10.219 M-F 2:00- 3:15                       | 25 LERNER, W |          |

|  |              |          |
|--|--------------|----------|
| <b>HST 123S Madness and Society in Historical Perspective.(SS)</b> | <b>1</b>     | <b>3</b> |
| 201954 01 W10.232 M-F 9:30-10:45                                   | 15 MILLER, M |          |

|  |              |          |
|--|--------------|----------|
| <b>HST 239 History of Socialism and Communism.(CZ)</b> | <b>1</b>     | <b>3</b> |
| 201961 01 W10.219 M-F 2:00- 3:15                       | 15 LERNER, W |          |

HST 299S Eastern Europe  
in Modern Times.(CZ)\* 1 3  
201968 01 W10.219 M-F 11:00-12:15 09 LERNER, W

## ITALIAN

IT 001 Elementary Italian.(FL)<sup>T</sup> 1 3  
201975 01 W10.220 M-F 9:30-10:45 22 CASA, L

## LATIN

LAT 014S Intensive Elementary  
Latin.(FL)<sup>1</sup> 2 6  
201982 01 W5.08 M-F 9:00-12:00 15 PETERSON, K

## LITERATURE

LIT 020S Introduction to Literature.(AL) 1 3  
201989 01 W10.220 MTH 6:00-8:05 15 MIDDLETON, J  
LIT 123 Sexual Politics:  
The Question of Pleasure.(AL) 1 3  
201996 01 W10.219 MTH 5:00-7:05 15 DOYLE, J B

## MANAGEMENT SCIENCES

MS 161 Marketing Management.<sup>P</sup> 1 3  
202115 01 W9.129 MTH 7:20-9:25 35 SUHOMLINOVA, O

## MATHEMATICS

MTH 031L Laboratory Calculus I.(QR) 1 3  
202122 01 W49.205 M-F 8:00-10:00 30 STAFF

MTH 032 Introductory  
Calculus II.(QR)<sup>P</sup> 1 3  
202129 01 W49.120 M-F 8:00-9:15 30 STAFF

MTH 103 Intermediate Calculus.(QR)<sup>P</sup> 1 3  
202136 01 W49.120 M-F 9:30-10:45 30 STAFF

MTH 104 Linear Algebra  
and Applications.(QR)<sup>P</sup> 1 3  
202143 01 W49.216 M-F 9:30-10:45 20 TAALMAN, L A

## MECHANICAL ENGINEERING

ME 130L Modeling and Analysis of Dynamic  
Systems.<sup>EP</sup> 1 4  
202066 01 W47.232 M-F 8:00-9:15 20 WRIGHT, D  
W47.232 MW 2:00-4:45 20 WRIGHT, D

ME 165 Special Topics in Mechanical  
Engineering.<sup>A</sup> var var  
202073 01 TBA 10 STAFF

ME 198 Projects in Mechanical  
Engineering.<sup>AP</sup> var var  
202080 01 TBA 10 STAFF

ME 265 Advanced Topics in Mechanical  
Engineering.<sup>A</sup> var  
202087 01 TBA 10 STAFF  
202094 02 TBA 10 STAFF

ME 399 Special Readings in Mechanical  
Engineering.<sup>AD</sup> var  
202101 01 TBA 10 STAFF

## MICROBIOLOGY

MIC 209 Independent Study.<sup>AU</sup> var var  
202108 01 TBA 10 STAFF

## MUSIC

MUS 081 Strings.<sup>AJT</sup> .25 1  
202150 01 TBA 15 LILE, J D

MUS 085 Voice.<sup>AJT</sup> .25 1  
202157 01 TBA 10 LAIL, H W

MUS 091 Strings.<sup>AJT</sup> .5 2  
202164 01 TBA 15 REED, R E  
202171 07 TBA 15 LILE, J D

## NEW TESTAMENT

NT 103 Hellenistic Greek.<sup>D</sup> 1 3  
202178 01 M-F 12:15-3:15 20 EFIRD, J M

NT 104 Hellenistic Greek.<sup>D</sup> 1 3  
202185 01 TBA 20 EFIRD, J M

NT 116C Selected Later Epistles.<sup>D</sup> 1 3  
202192 01 M-F 9:15-11:30 30 EFIRD, J M

NT 399 Apocalyptic Elements  
in Paul's Theology 1 3  
202199 01 TBA 10 HAYS, R B

## PATHOLOGY

PTH 210 Independent Study.<sup>A</sup> var var  
202465 01 TBA 10 KLINTWORTH, G K  
202472 02 TBA 10 PIZZO, S  
202479 03 TBA 10 BIGNER, D D

PTH 357 Research in Pathology.<sup>A2</sup> var  
202486 01 TBA 10 BIGNER, D D  
202493 02 TBA 10 PIZZO, S  
202500 07 TBA 10 SHELburne, J D  
202507 09 TBA 10 SWENBERG, J A

PTH 367 Special Topics in Pathology.<sup>D</sup> var  
202514 01 TBA 10 STAFF

PTH 380 Diagnostic Immunology.<sup>A</sup> var  
202521 01 TBA 40 STAFF

## PHARMACOLOGY

PHR 200 Medical Pharmacology.<sup>DR</sup> 1 4  
202325 01 M-F 9:00-12:00 30 STAFF

PHR 210 Individual Study  
and Research.<sup>A</sup> var var  
202332 01 TBA 10 STAFF  
202339 03 TBA 10 FREMEAU, R T  
202346 19 TBA 10 SLOTKIN, T A

PHR 211 Individual Study  
and Research.<sup>A2</sup> var var  
202353 01 TBA 10 STAFF

## PHILOSOPHY

PHL 043S Introduction  
to Philosophy.(CZ)<sup>M</sup> 1 3  
202304 01 W4.421 M-F 9:30-10:45 15 FEHR, C J

PHL 048 Logic.(CZ) 1 3  
202311 01 W10.220 M-F 11:00-12:15 20 FETZER, D L

PHL 196S Environmental Ethics.(CZ) 1 3  
202318 01 W10.232 MTH 5:00-7:05 15 MEDEIROS, P J

## PHYSICAL EDUCATION

PE 011 Cardiorespiratory  
Conditioning.<sup>LT</sup> .5 2  
202220 01 W17. MTH 5:00-7:05 30 OGILVIE, J S

PE 014 Stress Management  
and Performance Enhancement.<sup>LT</sup> .5 2  
202227 01 W17. M-F 9:30-10:45 20 BUEHLER/BURK

PE 015 Weight Training.<sup>LT</sup> .5 2  
202234 01 W17. M-F 11:00-12:15 30 OGILVIE, N F

202241 02 W17. M-F 3:30-4:45 30 FALCONE, C M

PE 017 Mountain Biking.<sup>LT</sup> 2  
202248 01 W17. M-F 11:00-12:15 15 YAKOLA, S D

PE 170 History and Issues of Sports. 1 3  
202255 01 W17.107 MTH 6:00-8:05 15 BUEHLER, A

PE 172 Administration  
in Sports Management. 1 3  
202262 01 W17.104 M-F 9:30-10:45 25 ALLEVA, J L

PE 174 Sports Marketing of Collegiate  
Athletic Events. 1 3  
202269 01 W17.104 M-F 12:30-1:45 20 YAKOLA, S D

## PHYSICAL THERAPY

PT 321 Evaluation and Therapeutic  
Procedures II.<sup>B</sup> 2  
202458 01 TBA 40 FIGUERS, C C

## PHYSICS

PHY 053L General Physics.(NS)<sup>FP</sup> 1 4  
202360 01 W49.114 M-F 11:00-12:15 70 ROGOSA, G L  
W49.103 TH 1:40-4:40 70 ROGOSA, G L

## POLITICAL SCIENCE

PS 175A Distributive Justice and the  
Social Sciences (C-N).(SS)<sup>CP</sup> 1 3  
ALSO TAUGHT AS: ECO 199  
202402 01 W10.225 M-F 11:00-12:15 05 ZHOU, W

## PSYCHOLOGY

PSY 091 Biological Bases of Behavior:  
Introduction and Survey (B).(NS)<sup>P</sup> 1 3  
202409 01 W9.127 MTH 6:00-8:05 30 ERICKSON, C J  
PSY 109A Health Psychology (P).(SS) 1 3  
202416 01 W9.127 M-F 9:30-10:45 25 HAMILTON, J A  
PSY 111 Learning  
and Adaptive Behavior (B, C).(NS)<sup>P</sup> 1 3  
202423 01 W9.126 MTH 5:00-7:05 30 SCHMAJUK, N

PSY 117 Statistical Methods (G).(QR)<sup>CT</sup> 1 3  
ALSO TAUGHT AS: SOC 133  
202430 01 W9.127 M-F 11:00-12:15 20 MORSE, J Q  
202437 02 W10.111 M-F 12:30-1:45 15 KRISHNA, A  
PSY 119A Abnormal Psychology (P).(SS) 1 3  
202444 01 W9.126 M-F 11:00-12:15 30 ROBINS, C J  
PSY 137 Adolescence (D).(SS) 1 3  
202451 01 W9.127 M-F 2:00-3:15 30 HARDY, K K

## PUBLIC POLICY STUDIES

PPS 081 Essentials of Public Speaking.<sup>T</sup> 1 3  
202374 01 W25.03 M-F 9:30-10:45 11 O'DOR, R E  
PPS 082 Essentials of Public Speaking.<sup>TU</sup> 1 3  
202381 01 W25.03 M-F 9:30-10:45 11 O'DOR, R E

## RELIGION

REL 042 Islam.(CZ) 1 3  
202528 01 W3.228 MTH 6:00-8:05 20 ALI, K  
REL 045 Religions of Asia.(CZ) 1 3  
202535 01 W3.228 M-F 11:00-12:15 20 ROZENHAL, R  
REL 148 Alternative Religion  
in America.(CZ) 1 3  
202542 01 W3.228 M-F 12:30-1:45 20 HALMAN, H T  
REL 185 Ethics and the Internet. 1 3  
202787 01 W3.220 MTH 6:00-8:05 15 ROBINSON, W

## RESEARCH

RES 001 var var  
202549 01 TBA 100 STAFF

## RUSSIAN

RUS 193 Independent Study.<sup>ASU</sup> 1 3  
202563 01 TBA 10 DUKE IN RUSSIA  
RUS 194 Independent Study.<sup>ASU</sup> 1 3  
202570 01 TBA 10 DUKE IN RUSSIA  
RUS 399 Special Readings.<sup>ADS</sup> 3  
202577 01 TBA 10 DUKE IN RUSSIA  
202584 02 TBA 10 DUKE IN RUSSIA

## SOCIOLOGY

SOC 133 Statistical Methods.(QR)<sup>CT</sup> 1 3  
ALSO TAUGHT AS: PSY 117  
202591 01 W9.127 M-F 11:00-12:15 15 MORSE, J Q  
202598 02 W10.111 M-F 12:30-1:45 20 KRISHNA, A  
SOC 153 Sport and Society.(SS) 1 3  
202605 01 W9.129 M-F 11:00-12:15 30 WILSON, J D  
SOC 155 Organizations  
and Management.(SS) 1 3  
202612 01 W9.128 MTH 5:00-7:05 25 SUHOMLINOVA, O

## SPANISH

SP 001 Elementary Spanish.(FL)<sup>TC</sup> 1 3  
202619 01 W5.211 M-F 9:30-10:45 22 MARTURANO, J G  
SP 063 Intermediate Spanish.(FL)<sup>PT</sup> 1 3  
202626 01 W5.211 M-F 11:00-12:15 22 GAJIC, T

## STATISTICS

STA 110A Statistics and Data Analysis in the  
Social Sciences.(QR) 1 3  
202633 01 W6.116 M-F 9:30-10:45 30 KERN, J  
W6.116 F 11:00-12:15 30 KERN, J

## UNIVERSITY WRITING COURSE

UWC 117S Advanced Composition I.<sup>CPT</sup> 1 3  
ALSO TAUGHT AS: ENG 117A  
202696 01 W53.306 M-F 3:30-4:45 06 KELLOGG, D R

## WOMEN'S STUDIES PROGRAM

WST103 An Introduction to  
Women's Studies.(SS) 1 3  
202703 01 W10.229 MTH 7:20-9:25 20 STAFF

## ZOOLOGY

ZOO 274L Marine Invertebrate  
Zoology.<sup>CDPX</sup> .5 6  
ALSO TAUGHT AS: ENV 295L  
202710 01 20 KIRBY-SMITH, W  
ZOO 353 Research.<sup>ADX</sup> var  
202717 01 TBA 10 STAFF  
202724 26 TBA 10 RITTSCHOF, D  
202731 56 TBA 10 SMITH, K K  
ZOO 354 Research.<sup>AD</sup> var  
202738 15 TBA 10 LIVINGSTONE, D  
202745 39 TBA 10 VOGEL, S  
ZOO 360 Tutorials.<sup>A2</sup> var  
202752 01 TBA 10 STAFF



ZOO 360T TUTORIAL<sup>AD</sup>

|           |     |    |              |
|-----------|-----|----|--------------|
| 202759 01 | TBA | 10 | STAFF        |
| 202766 26 | TBA | 10 | RITTSCHOF, D |
| 202773 68 | TBA | 10 | MOTTEN, A    |

var

ZOO 361T TUTORIAL<sup>AD</sup>

|           |     |    |       |
|-----------|-----|----|-------|
| 202780 01 | TBA | 10 | STAFF |
|-----------|-----|----|-------|

var



## Summer Term II July 6–August 15

### AFRICAN-AMERICAN STUDIES PROGRAM

AAS 124S Slave Society in Colonial  
Anglo-America: The West Indies, South  
Carolina, and Virginia.(CZ)<sup>C</sup> 1 3  
ALSO TAUGHT AS: HST 124S  
300008 01 W10.232 M-F 12:30-1:45 05 GASPAR, D B

### ARABIC

ARB 002 Elementary Arabic.(FL)<sup>TV</sup> 1 3  
300925 01 W36. M-F 11:00-12:15 20 CHERGUI, A

### ART HISTORY

ARH 070 Introduction  
to the History of Art.(AL) 1 3  
300932 01 W10.139 M-F 11:00-12:15 30 BRODERSON, D K

### ASIAN & AFRICAN LANGUAGES/ LITERATURE

AAL 165S Modern Arabic Literature in  
Translation.(AL) 1 3  
300001 01 W36. MTH 6:00-8:05 15 CHERGUI, A

### BIOCHEMISTRY

BCH 209 Independent Study.<sup>A</sup> 1 var  
300960 01 TBA 10 STAFF

BCH 210 Independent Study.<sup>A</sup> 1 var  
300967 01 TBA 10 GARRETT, S  
300974 02 TBA 10 STAFF

### BIOLOGICAL ANTHROPOLOGY & ANATOMY

BAA 093 Introduction to Biological  
Anthropology.(NS) 1 3  
300946 01 W58.130 M-F 12:30-1:45 30 RASMUSSEN, M A

BAA 132 Human Evolution.(NS)<sup>P</sup> 1 3  
300953 01 W58.130 M-F 9:30-10:45 40 JOHNSON, D D

### BIOLOGY

BIO 043D Ecology and Society.(NS) 1 3  
300981 01 W58.130 M-F 3:45-5:00 40 LICHTER, J

BIO 126L Marine Mammals.(NS)<sup>PX</sup> 1 4  
300988 01 TBA 10 REYLDs/READ/STF

BIO 129L Marine Ecology.(NS)<sup>PX</sup> 1 4  
300995 01 TBA 15 KIRBY-SMITH, W

BIO 176L Marine Invertebrate  
Zoology.(NS)<sup>PX</sup> 1 4  
301002 01 TBA 20 DIMOCK, R V

BIO 192 Independent Study.<sup>AX</sup> 1 3  
301009 01 TBA 10 STAFF

BIO 193T Tutorial.<sup>AUX</sup> 1 3  
301016 01 TBA 10 STAFF

BIO 194T Tutorial.<sup>AUX</sup> 1 3  
301023 01 TBA 10 STAFF

BIO 218L Barrier Island Ecology.(NS)<sup>CPX</sup> 1 4  
ALSO TAUGHT AS: ENV 218L  
301030 01 TBA 15 EVANS/PETE/WELL

### BIOMEDICAL ENGINEERING

BME 191 Projects in Biomedical  
Engineering.<sup>AU</sup> var var  
301037 01 TBA 10 STAFF

BME 192 Projects in Biomedical  
Engineering.<sup>AU</sup> var var  
301044 01 TBA 10 STAFF

BME 265 Advanced Topics in Biomedical  
Engineering.<sup>A</sup> 1 var  
301051 01 TBA 10 STAFF

BME 399 Special Readings in Biomedical  
Engineering.<sup>AD</sup> var  
301058 01 TBA 10 STAFF

### BOTANY

BOT 218L Barrier Island Ecology.<sup>CDEPX</sup> 6  
ALSO TAUGHT AS: ENV 218L  
301065 01 TBA 05 EVANS/PETE/WELL

BOT 225T Special Problems.<sup>AD</sup> var  
301072 58 TBA 05 DONG, X

### CELL BIOLOGY

CBI 210 Independent Study.<sup>A2</sup> var var  
301093 01 TBA 10 STAFF  
301100 16 TBA 10 GARRETT, W E

### CHEMISTRY

CHM 012L Principles of Chemistry.(NS)<sup>FP</sup> 1 4  
301149 01 W65.110 M-F 11:00-12:15 20 WOERNER, T E  
W65.204 TH 1:15-5:15 20 WOERNER, T E

CHM 023L Advanced General  
Chemistry.(NS)<sup>EP</sup> 1 4  
301156 01 W65.111 M-F 11:00-12:15 20 MONTAGUE-SMITH  
W65.203 TH 1:15-5:15 20 MONTAGUE-SMITH

CHM 152L Organic Chemistry.(NS)<sup>EP</sup> 1 4  
301163 01 W65.107 M-F 11:00-12:15 70 BALDWIN, S W  
W65.226 TH 1:15-5:15 70 BALDWIN, S W

### CHINESE

CHN 111A Intensive Progress in Spoken  
Chinese Intermediate Level.(FL)<sup>AS</sup> 1 3  
301170 01 TBA 50 DUKE IN CHINA

CHN 111B Intensive Progress in Reading  
Chinese Intermediate Level.(FL)<sup>S</sup> 1 3  
301177 01 TBA 40 DUKE IN CHINA

CHN 112A Intensive Progress in Spoken  
Chinese Advanced Level.(FL)<sup>S</sup> 1 3  
301184 01 TBA 40 DUKE IN CHINA

CHN 112B Intensive Progress in Reading  
Chinese Advanced Level.(FL)<sup>S</sup> 1 3  
301191 01 TBA 40 DUKE IN CHINA

### CIVIL ENGINEERING

CE 142 Special Topics  
in Civil Engineering.<sup>A</sup> var var  
301107 01 TBA 10 STAFF

|   |     |     |
|---|-----|-----|
| CE 198 Projects in Civil Engineering. <sup>AU</sup>                           | var | var |
| 301114 01 TBA 10 STAFF  |     |     |
| CE 265 Advanced Topics in Civil and Environmental Engineering.                | 1   | var |
| 301121 01 TBA 10 STAFF  |     |     |
| CE 399 Special Readings in Civil and Environmental Engineering. <sup>AD</sup> | var |     |
| 301128 01 TBA 18 STAFF  |     |     |

## CLASSICAL STUDIES

|   |   |   |
|---|---|---|
| CS 012S Roman Civilization.(CZ)                     | 1 | 3 |
| 301212 01 W53.234 M-F 2:00-3:15 15 PRINCE, M D      |   |   |
| CS 180 Magic and Superstition in the Ancient World. | 1 | 3 |
| 301219 01 W53.226 M-F 3:30-4:45 20 BERNSTEIN, N W   |   |   |

## COMPUTER SCIENCE

|  |   |   |
|--|---|---|
| CPS 001 Computer Science Fundamentals.(QR)     | 1 | 3 |
| 301198 01 W76.D106 M-F 9:00-10:15 40 STAFF     |   |   |
| W56.130 TH 10:20-11:30 40 STAFF                |   |   |
| CPS 004 Introduction to Programming.(QR)       | 1 | 3 |
| 301205 01 W76.D106 M-F 2:00-3:15 40 DUVAL, R C |   |   |
| W76.D106 TH 3:20-4:30 40 DUVAL, R C            |   |   |

## CONTINUATION

|                         |  |  |
|-------------------------|--|--|
| CTN001 CONTINUATION     |  |  |
| 301226 01 TBA 900 STAFF |  |  |

## CULTURAL ANTHROPOLOGY

|   |   |   |
|---|---|---|
| CA 141 Self and Society.(SS) <sup>C</sup>         | 1 | 3 |
| ALSO TAUGHT AS: PSY 113A                          |   |   |
| 301079 01 W10.124 M-F 12:30-1:45 15 FRIEDMAN, J R |   |   |
| CA 180S Anthropology and American Culture.(SS)    | 1 | 3 |
| 301086 01 W10.124 M-F 2:00-3:15 15 MCCOLLUM, C C  |   |   |

## DRAMA

|  |   |   |
|--|---|---|
| DRA 099S Introduction to Performance.(AL)                      | 1 | 3 |
| 301233 01 SHAEFER M-F 12:30-1:45 14 SCHILLING, S B             |   |   |
| DRA 174 Studies in Film History: Silent Film.(AL) <sup>C</sup> | 1 | 3 |
| ALSO TAUGHT AS: ENG 185, LIT 116                               |   |   |
| 301240 01 EB.106 MTH 6:00-9:25 08 PALETZ, G                    |   |   |

## ECONOMICS

|   |   |   |
|---|---|---|
| ECO 051D National Income and Public Policy.(SS)       | 3 |   |
| 301247 01 W10.213 M-F 9:30-10:45 40 MEARDON, S J      |   |   |
| ECO 052D Competition, Monopoly, and Welfare.(SS)      | 1 | 3 |
| 301254 01 W10.213 M-F 11:00-12:15 35 GILBERT, J L     |   |   |
| ECO 083 Financial Accounting and Decision Making.(SS) | 1 | 3 |
| 301261 01 W10.229 M-F 12:30-1:45 25 AUSTIN, A M       |   |   |
| ECO 149 Microeconomics.(SS) <sup>P</sup>              | 1 | 3 |
| 301268 01 W10.229 M-F 9:30-10:45 30 GEE, G M          |   |   |

|   |   |   |
|---|---|---|
| ECO 154 Macroeconomics.(SS) <sup>P</sup>                          | 1 | 3 |
| 301275 01 W10.213 M-F 12:30-1:45 25 MEARDON, S J                  |   |   |
| ECO 158 Financial Markets and Investments.(SS) <sup>P</sup>       | 1 | 3 |
| 301282 01 W10.229 M-F 11:00-12:15 20 LUNDBLAD, C T                |   |   |
| ECO 165 American International Economic Policy.(SS) <sup>CP</sup> | 1 | 3 |
| ALSO TAUGHT AS: PPS 165   |   |   |
| 301289 01 W10.327 M-F 9:30-10:45 15 VINLUAN, J B                  |   |   |
| ECO 254 Macroeconomics.(SS)                                       | 1 | 3 |
| 301296 01 W10.213 M-F 12:30-1:45 05 MEARDON, S J                  |   |   |

## EDUCATION

|  |   |   |
|--|---|---|
| EDU 100 Social and Philosophical Foundations of Education.(SS) | 1 | 3 |
| 301303 01 W10.111 M-F 11:00-12:15 20 DI BONA, J E              |   |   |
| EDU209 Global Education.(SS)                                   | 1 | 3 |
| 301310 01 W10.111 M-F 12:30-1:45 20 DI BONA, J E               |   |   |

## ELECTRICAL ENGINEERING

|  |     |     |
|--|-----|-----|
| EE 141 Linear Control Systems. <sup>P</sup>                            | 1   | 3   |
| 301317 01 W47.232 M-F 9:30-10:45 10 WRIGHT, D                          |     |     |
| EE 191 Undergraduate Research in Electrical Engineering. <sup>AU</sup> | var | var |
| 301324 03 TBA 10 YBARRA, G A   |     |     |
| EE 195 Special Topics in Electrical Engineering. <sup>A</sup>          | var | var |
| 301331 01 TBA 10 STAFF   |     |     |
| EE 197 Projects in Electrical Engineering. <sup>AU</sup>               | var | var |
| 301338 01 TBA 10 STAFF   |     |     |
| 301345 03 TBA 10 GELENBE, E D  |     |     |
| EE 198 Projects in Electrical Engineering. <sup>AU</sup>               | var | var |
| 301352 01 TBA 10 GELENBE, E D  |     |     |
| EE 299 Advanced Topics in Electrical Engineering. <sup>A</sup>         | 1   | var |
| 301359 01 TBA 10 GELENBE, E D  |     |     |
| 301366 02 TBA 03 STAFF   |     |     |
| 301373 03 TBA 02 FAIR, R B   |     |     |
| EE 399 Special Readings in Electrical Engineering. <sup>AD</sup>       | var |     |
| 301380 01 TBA 10 STAFF   |     |     |

## ENGINEERING

|   |     |     |
|---|-----|-----|
| EGR 050 Introduction to Numerical Computing.        | 1   | 3   |
| 301387 01 W47.208 M-F 9:30-10:45 40 STAFF           |     |     |
| EGR 165 Special Topics in Engineering. <sup>A</sup> | var | var |
| 301394 01 TBA 10 STAFF                              |     |     |
| EGR 184 Projects in Engineering. <sup>A</sup>       | 1   | 3   |
| 301401 01 TBA 10 STAFF                              |     |     |

## ENGLISH

|  |   |   |
|--|---|---|
| ENG 063S Introduction to Creative Writing.(AL) | 1 | 3 |
| 301408 01 W53.306 M-F 2:00-3:15 15 PARSI, N    |   |   |

|   |                  |   |   |
|---|------------------|---|---|
| <b>ENG 090S Reading Critically: Poetry, Fiction, Drama.(AL)</b>           |                  |   |   |
| 301415 01 W53.306 M-F 11:00-12:15   | 15 BUTTERS, R R  | 1 | 3 |
| <b>ENG 117A S. Advanced Composition I.<sup>CPT</sup></b>                  |                  |   |   |
| 301422 01 W53.306 M-F 5:00-7:05   | 08 RUSSELL, V G  | 1 | 3 |
| <b>ENG 137 Nineteenth-Century British Novel.(AL)</b>                      |                  |   |   |
| 301429 01 W53.318 M-F 11:00-12:15   | 25 DAVIDSON, A E | 1 | 3 |
| <b>ENG 170 Gender And Race In Twentieth Century American Fiction.(AL)</b> |                  |   |   |
| 301436 01 W53.306 M-F 9:30-10:45  | 15 DAVIDSON, A E | 1 | 3 |
| <b>ENG 185 Studies in Film History: Silent Film.(AL)<sup>C</sup></b>      |                  |   |   |
| 301443 01 W10.229 MTH 6:00-9:25   | 08 PALETZ, G     | 1 | 3 |

**ENVIRONMENT**

|  |                    |     |     |
|--|--------------------|-----|-----|
| <b>ENV 192 Independent Study.<sup>AU</sup></b> |                    |     |     |
| 301450 01 TBA                                  | 10 MANSFIELD, C A  | var | var |
| 301457 04 TBA                                  | 10 FREEDMAN, J     |     |     |
| 301464 06 TBA                                  | 10 DIGIULIO, R T   |     |     |
| 301471 07 TBA                                  | 10 DUTROW, G F     |     |     |
| 301478 08 TBA                                  | 10 URBAN, D        |     |     |
| 301485 09 TBA                                  | 10 SMITH, K        |     |     |
| 301492 10 TBA                                  | 10 HEATH, M S      |     |     |
| 301499 11 TBA                                  | 10 SIGMON, J       |     |     |
| 301506 13 TBA                                  | 10 KNOERR, K       |     |     |
| 301513 14 TBA                                  | 10 KRAMER, R       |     |     |
| 301520 15 TBA                                  | 10 MAGUIRE, L      |     |     |
| 301527 16 TBA                                  | 10 LOBER, D        |     |     |
| 301534 17 TBA                                  | 10 RECKHOW, K      |     |     |
| 301541 18 TBA                                  | 10 RICHARDSON, C   |     |     |
| 301548 19 TBA                                  | 10 RICHTER, D      |     |     |
| 301555 21 TBA                                  | 10 KATUL, G        |     |     |
| 301562 22 TBA                                  | 10 STAMBAUGH, W G  |     |     |
| 301569 24 TBA                                  | 10 VESILIND, A     |     |     |
| 301576 25 TBA                                  | 10 SHARMA, N       |     |     |
| 301583 26 TBA                                  | 10 WEAR, D         |     |     |
| 301590 27 TBA                                  | 10 CHRISTENSEN, N  |     |     |
| 301597 30 TBA                                  | 10 HEALY, R G      |     |     |
| 301604 33 TBA                                  | 10 TULIS, J        |     |     |
| 301611 34 TBA                                  | 10 OREN, R         |     |     |
| 301618 35 TBA                                  | 10 DUBAY, G R      |     |     |
| 301625 36 TBA                                  | 10 PILKEY, O H     |     |     |
| 301632 39 TBA                                  | 10 TERBORGH, J W   |     |     |
| 301639 40 TBA                                  | 10 VANDENBERG, J   |     |     |
| 301646 44 TBA                                  | 05 BARBER, R T     |     |     |
| 301653 45 TBA                                  | 10 BONAVENTURA, C  |     |     |
| 301660 46 TBA                                  | 05 BONAVENTURA, J  |     |     |
| 301667 47 TBA                                  | 05 FORWARD, R C    |     |     |
| 301674 51 TBA                                  | 05 KIRBY-SMITH, W  |     |     |
| 301681 52 TBA                                  | 05 LOZIER, M S     |     |     |
| 301688 53 TBA                                  | 05 RAMUS, J S      |     |     |
| 301695 54 TBA                                  | 05 RITTSCHOF, D    |     |     |
| 301702 58 TBA                                  | 05 ORBACH, M K     |     |     |
| 301709 59 TBA                                  | 10 JOHNSON, J A    |     |     |
| 301716 60 TBA                                  | 10 CROWDER, L B    |     |     |
| 301723 61 TBA                                  | 10 READ, A J       |     |     |
| 301730 62 TBA                                  | 10 MCCLELLAN-GREEN |     |     |
| 301737 63 TBA                                  | 10 ROJSTACZER, S   |     |     |
| 301744 64 TBA                                  | 10 MIRANDA, M L    |     |     |
| 301751 65 TBA                                  | 10 AHMANN, D M     |     |     |
| 301758 66 TBA                                  | 10 SNOOK, L K      |     |     |
| 301765 69 TBA                                  | 10 STOW, C         |     |     |
| 301772 70 TBA                                  | 10 KEOHANE, R O    |     |     |
| 301779 71 TBA                                  | 10 COOPER, S       |     |     |

|  |                    |     |     |
|--|--------------------|-----|-----|
| 301786 72 TBA  | 10 ROMANOWICZ, E   |     |     |
| 301793 73 TBA  | 10 HALPIN, P N     |     |     |
| 301800 74 TBA  | 10 MERCER, E C     |     |     |
| 301807 75 TBA  | 10 KASIBHATLA, P   |     |     |
| 301814 76 TBA  | 10 VASUDEVAN, D    |     |     |
| <b>ENV 209 Conservation Biology and Policy.<sup>PX</sup></b> |                    |     |     |
| 301821 01 TBA  | 40 CROWDER/RUBENST | 1   | 3   |
| <b>ENV 218L Barrier Island Ecology.<sup>CPX</sup></b>        |                    |     |     |
| 301828 01 TBA  | 15 EVANS/PETE/WELL | 1   | 4   |
| <b>ENV 219L Marine Ecology.<sup>CDPX</sup></b>               |                    |     |     |
| 301835 01 TBA  | 06 KIRBY-SMITH, W  | 1   | 4   |
| <b>ENV 226L Marine Mammals.<sup>DPX</sup></b>                |                    |     |     |
| 301842 01 TBA  | 10 REYNOLDS/REED   | 1   | 4   |
| <b>ENV 276 Marine Policy.<sup>ACX</sup></b>                  |                    |     |     |
| 301849 01 TBA  | 15 STAFF           | 1   | 3   |
| <b>ENV 295L Marine Invertebrate Zoology.<sup>CDPX</sup></b>  |                    |     |     |
| 301856 01 TBA  | 20 DIMOCK, R V     |     | 4   |
| <b>ENV 299 Independent Studies and Projects.<sup>A</sup></b> |                    |     |     |
| 301863 01 TBA  | 10 MANSFIELD, C A  | var | var |
| 301870 04 TBA  | 10 FREEDMAN, J A   |     |     |
| 301877 06 TBA  | 10 DI GIULIO, R T  |     |     |
| 301884 07 TBA  | 10 DUTROW, G F     |     |     |
| 301891 08 TBA  | 10 URBAN, D L      |     |     |
| 301898 09 TBA  | 10 SMITH, V K      |     |     |
| 301905 10 TBA  | 10 HEATH, M S      |     |     |
| 301912 11 TBA  | 10 SIGMON, J T     |     |     |
| 301919 13 TBA  | 10 KNOERR, K R     |     |     |
| 301926 14 TBA  | 10 KRAMER, R A     |     |     |
| 301933 15 TBA  | 10 MAGUIRE, L A    |     |     |
| 301940 16 TBA  | 10 LOBER, D J      |     |     |
| 301947 17 TBA  | 10 RECKHOW, K H    |     |     |
| 301954 18 TBA  | 10 RICHARDSON, C J |     |     |
| 301961 19 TBA  | 10 RICHTER, D D    |     |     |
| 301968 21 TBA  | 10 KATUL, G G      |     |     |
| 301975 22 TBA  | 10 STAMBAUGH, W G  |     |     |
| 301982 24 TBA  | 10 VESILIND, P A   |     |     |
| 301989 25 TBA  | 10 SHARMA, N A     |     |     |
| 301996 26 TBA  | 10 WEAR, D N       |     |     |
| 302003 27 TBA  | 10 CHRISTENSEN, N  |     |     |
| 302010 30 TBA  | 10 HEALY, R G      |     |     |
| 302017 33 TBA  | 10 TULIS, J J      |     |     |
| 302024 34 TBA  | 10 OREN, R         |     |     |
| 302031 35 TBA  | 10 DUBAY, G R      |     |     |
| 302038 36 TBA  | 10 PILKEY, O H     |     |     |
| 302045 39 TBA  | 10 TERBORGH, J W   |     |     |
| 302052 40 TBA  | 10 VANDENBERG, J   |     |     |
| 302059 44 TBA  | 10 BARBER, R T     |     |     |
| 302066 45 TBA  | 10 BONAVENTURA, C  |     |     |
| 302073 46 TBA  | 10 BONAVENTURA, J  |     |     |
| 302080 47 TBA  | 10 FORWARD, R B    |     |     |
| 302087 51 TBA  | 10 KIRBY-SMITH, W  |     |     |
| 302094 52 TBA  | 10 LOZIER, M S     |     |     |
| 302101 53 TBA  | 10 RAMUS, J S      |     |     |
| 302108 54 TBA  | 10 RITTSCHOF, D    |     |     |
| 302115 58 TBA  | 10 ORBACH, M K     |     |     |
| 302122 59 TBA  | 10 JOHNSON, J A    |     |     |
| 302129 60 TBA  | 05 CROWDER, L B    |     |     |
| 302136 61 TBA  | 05 READ, A J       |     |     |
| 302143 62 TBA  | 05 MCCLELLAN-GREEN |     |     |
| 302150 63 TBA  | 05 ROJSTACZER, S   |     |     |
| 302157 64 TBA  | 05 MIRANDA, M L    |     |     |



|  |     |                    |
|--|-----|--------------------|
| 302164 65                                    | TBA | 10 AHMANN, D M     |
| 302171 66                                    | TBA | 10 SNOOK, L K      |
| 302178 69                                    | TBA | 10 STOW, C         |
| 302185 70                                    | TBA | 10 KEOHANE, R O    |
| 302192 71                                    | TBA | 10 COOPER, S       |
| 302199 72                                    | TBA | 10 ROMANOWICZ, E   |
| 302206 73                                    | TBA | 10 HALPIN, P N     |
| 302213 74                                    | TBA | 10 MERCER, D E     |
| 302220 75                                    | TBA | 10 KASIBHATLA, P   |
| 302227 76                                    | TBA | 10 VASUDEVAN, D    |
| 302234 99                                    | TBA | 10 STAFF           |
| ENV 399 Master's Project. <sup>ADL</sup> var |     |                    |
| 302241 01                                    | TBA | 10 MANSFIELD, C A  |
| 302248 04                                    | TBA | 10 FREEDMAN, J A   |
| 302255 06                                    | TBA | 10 DI GIULIO, R T  |
| 302262 07                                    | TBA | 10 DUTROW, G F     |
| 302269 08                                    | TBA | 10 URBAN, D L      |
| 302276 09                                    | TBA | 10 SMITH, V K      |
| 302283 10                                    | TBA | 10 HEATH, M S      |
| 302290 11                                    | TBA | 10 SIGMON, J T     |
| 302297 13                                    | TBA | 10 KNOERR, K R     |
| 302304 14                                    | TBA | 10 KRAMER, R A     |
| 302311 15                                    | TBA | 10 MAGUIRE, L A    |
| 302318 16                                    | TBA | 10 LOBER, D J      |
| 302325 17                                    | TBA | 10 RECKHOW, K H    |
| 302332 18                                    | TBA | 10 RICHARDSON, C J |
| 302339 19                                    | TBA | 10 RICHTER, D D    |
| 302346 21                                    | TBA | 10 KATUL, G G      |
| 302353 22                                    | TBA | 10 STAMBAUGH, W G  |
| 302360 24                                    | TBA | 10 VESILIND, P A   |
| 302367 25                                    | TBA | 10 SHARMA, N P     |
| 302374 26                                    | TBA | 10 WEAR, D N       |
| 302381 27                                    | TBA | 10 CHRISTENSEN, N  |
| 302388 30                                    | TBA | 10 HEALY, R G      |
| 302395 33                                    | TBA | 10 TULIS, J J      |
| 302402 34                                    | TBA | 10 OREN, R         |
| 302409 36                                    | TBA | 10 PILKEY, O H     |
| 302416 39                                    | TBA | 10 TERBORGH, J W   |
| 302423 40                                    | TBA | 10 VANDENBERG, J   |
| 302430 44                                    | TBA | 10 BARBER, R T     |
| 302437 45                                    | TBA | 10 BONAVENTURA, C  |
| 302444 46                                    | TBA | 10 BONAVENTURA, J  |
| 302451 47                                    | TBA | 10 FORWARD, R B    |
| 302458 51                                    | TBA | 10 KIRBY-SMITH, W  |
| 302465 52                                    | TBA | 10 LOZIER, M S     |
| 302472 53                                    | TBA | 10 RAMUS, J S      |
| 302479 54                                    | TBA | 10 RITTSCHEOF, D   |
| 302486 58                                    | TBA | 10 ORBACH, M K     |
| 302493 59                                    | TBA | 10 JOHNSON, J A    |
| 302500 60                                    | TBA | 10 CROWDER, L B    |
| 302507 61                                    | TBA | 10 READ, A J       |
| 302514 62                                    | TBA | 10 MCCLELLAN-GREEN |
| 302521 63                                    | TBA | 10 ROJSTACZER, S   |
| 302528 64                                    | TBA | 10 MIRANDA, M L    |
| 302535 65                                    | TBA | 10 AHMANN, D M     |
| 302542 66                                    | TBA | 10 SNOOK, L K      |
| 302549 69                                    | TBA | 10 STOW, C         |
| 302556 70                                    | TBA | 10 KEOHANE, R O    |
| 302563 71                                    | TBA | 10 COOPER, S       |
| 302570 72                                    | TBA | 10 ROMANOWICZ, E   |
| 302577 73                                    | TBA | 10 HALPIN, P N     |
| 302584 74                                    | TBA | 10 MERCER, D E     |
| 302591 75                                    | TBA | 10 KASIBHATLA, P   |
| 302598 76                                    | TBA | 10 VASUDEVAN, D    |
| 302605 99                                    | TBA | 10 STAFF           |

## FRENCH

|   |                |   |
|---|----------------|---|
| FR 002 Elementary French.(FL) <sup>TV</sup> | 1              | 3 |
| 302612 01 W5.207 M-F 9:30-10:45             | 22 O'HARA, S E |   |

## FR 076 Advanced Intermediate

|                                  |              |   |
|----------------------------------|--------------|---|
| French.(FL) <sup>PT</sup>        | 1            | 3 |
| 302619 01 W5.207 M-F 11:00-12:15 | 22 GREY, N R |   |

FR 142S The French Love Story.(AL)(FL)<sup>U</sup>

|                                |                 |  |
|--------------------------------|-----------------|--|
| 303312 01 W5.305 MTH 5:00-7:05 | 15 LONGINO, M L |  |
|--------------------------------|-----------------|--|

## GEOLOGY

## GEO 041 The Dynamic Earth.(NS)

|                                 |                |  |
|---------------------------------|----------------|--|
| 302633 01 W6.101 M-F 9:30-10:45 | 30 MEURER, W P |  |
|---------------------------------|----------------|--|

## GERMAN

## GER 002 First-Year German: Introduction to

German Language and Culture.(FL)<sup>TV</sup>

|                                 |             |  |
|---------------------------------|-------------|--|
| 302640 01 W5.109 M-F 9:30-10:45 | 20 EVERS, K |  |
|---------------------------------|-------------|--|

## GER 069 Accelerated Intermediate

German.(FL)<sup>I</sup>

|                                  |                  |  |
|----------------------------------|------------------|--|
| 302647 01 W5.109 M-F 11:00-12:15 | 20 VILLANUEVA, D |  |
|----------------------------------|------------------|--|

## GREEK

## GRK 015S Intensive Intermediate

Greek.(FL)<sup>I</sup>

|                                 |               |  |
|---------------------------------|---------------|--|
| 302654 01 W4.421 M-F 9:00-12:00 | 15 SOSIN, J D |  |
|---------------------------------|---------------|--|

## HISTORY

## HST 022S Europe from the Eighteenth

## Century.(CZ)

|                                   |              |  |
|-----------------------------------|--------------|--|
| 302661 01 W10.232 M-F 11:00-12:15 | 15 MILLER, M |  |
|-----------------------------------|--------------|--|

## HST 092 America from 1877

## to the Present.(CZ)

|                                  |                |  |
|----------------------------------|----------------|--|
| 302668 01 W10.111 M-F 9:30-10:45 | 38 GASPAR, D B |  |
|----------------------------------|----------------|--|

## HST 124S Slave Society in Colonial

## Anglo-America: The West Indies, South

Carolina, and Virginia.(CZ)<sup>C</sup>

|                                  |                |  |
|----------------------------------|----------------|--|
| 302675 01 W10.232 M-F 12:30-1:45 | 13 GASPAR, D B |  |
|----------------------------------|----------------|--|

## HST 160 The United States from the New Deal to

## the Present.(CZ)

|                                 |                   |  |
|---------------------------------|-------------------|--|
| 302682 01 W10.111 M-F 2:00-3:15 | 30 HAZIRJIAN, L G |  |
|---------------------------------|-------------------|--|

## HST 195S Russian Revolutionary

Cinema.(CZ)<sup>U</sup>

|                                |              |  |
|--------------------------------|--------------|--|
| 302689 01 W5.320 MTH 7:20-9:25 | 15 MILLER, M |  |
|--------------------------------|--------------|--|

## HST 196S History of Sexuality

in America.(CZ)<sup>U</sup>

|                               |               |  |
|-------------------------------|---------------|--|
| 302696 01 W5.08 MTH 5:00-7:05 | 15 LEKUS, I K |  |
|-------------------------------|---------------|--|

## ITALIAN

IT 002 Elementary Italian.(FL)<sup>TV</sup>

|                                  |            |  |
|----------------------------------|------------|--|
| 302710 01 W10.220 M-F 9:30-10:45 | 20 CASA, L |  |
|----------------------------------|------------|--|

## LATIN

## LAT 015S Intensive Intermediate

Latin.(FL)<sup>I</sup>

|                                |                |  |
|--------------------------------|----------------|--|
| 302717 01 W5.08 M-F 9:00-12:00 | 15 PETERSON, K |  |
|--------------------------------|----------------|--|

## LITERATURE

## LIT 020S Introduction to Literature.(AL)

|                                  |                  |  |
|----------------------------------|------------------|--|
| 302724 01 W9.128 M-F 11:00-12:15 | 15 BIBERMAN, S M |  |
|----------------------------------|------------------|--|

|                                |               |  |
|--------------------------------|---------------|--|
| 302731 02 W9.128 M-F 3:30-4:45 | 15 BEEBE, R W |  |
|--------------------------------|---------------|--|

LIT 116 Studies in Film History:  
Silent Film.(A)L<sup>C</sup> 1 3  
ALSO TAUGHT AS: ENG 185, DRA 174  
302738 01 EB.106 MTH 6:00- 9:25 05 PALETZ, G

### MANAGEMENT SCIENCES

MS 120 Managerial Effectiveness.<sup>P</sup> 1 3  
302815 01 W10.111 MTH 6:00- 8:05 30 STAFF

### MASTER OF ARTS TEACHING

MAT 302 Educating Adolescents.<sup>D</sup> 3  
302745 01 M-F 8:30-11:30 25 BINGHAM, M Y

MAT 303 Effective Teaching Strategies.<sup>D</sup> 3  
302752 01 TBA 25 TEASLEY, A B

### MATHEMATICS

MTH 019 Precalculus  
Mathematics.(QR)<sup>T</sup> 1 3  
302822 01 W49.120 M-F 8:00- 9:15 30 STAFF

MTH 031L Laboratory Calculus I.(QR) 1 3  
302829 01 W49.205 M-F 8:00-10:00 30 STAFF

MTH 032L Laboratory Calculus II.(QR)<sup>P</sup> 1 3  
302836 01 W3.228 M-F 8:00-10:00 30 STAFF

MTH 103 Intermediate Calculus.(QR)<sup>P</sup> 1 3  
302843 01 W49.120 M-F 9:30-10:45 30 STAFF

MTH 104 Linear Algebra  
and Applications.(QR)<sup>P</sup> 1 3  
302850 01 W49.216 M-F 9:30-10:45 15 STAFF

### MECHANICAL ENGINEERING

ME 141L Mechanical Design.<sup>EP</sup> 1 4  
302759 01 W47.232 M-F 8:00- 9:15 20 WRIGHT, D  
W47.232 TH 2:00- 4:45 20 WRIGHT, D

ME 165 Special Topics in Mechanical  
Engineering.<sup>A</sup> var var  
302766 01 TBA 10 STAFF

ME 198 Projects in Mechanical  
Engineering.<sup>AP</sup> var var  
302773 01 TBA 10 STAFF

ME 265 Advanced Topics in Mechanical  
Engineering.<sup>A</sup> var var  
302780 01 TBA 10 STAFF  
302787 02 TBA 10 STAFF

ME 399 Special Readings in Mechanical  
Engineering.<sup>AD</sup> var  
302794 01 TBA 10 STAFF

### MICROBIOLOGY

MIC 210 Independent Study.<sup>AU</sup> var var  
302801 01 TBA 10 STAFF

MIC 399 SPECIAL READINGS<sup>AD</sup> 3  
302808 01 TBA 10 PICKUP, D J

### MUSIC

MUS 081 Strings.<sup>AJT</sup> .25 1  
302857 07 TBA 10 LILE, J D

MUS 085 Voice.<sup>AJT</sup> .25 1  
302864 01 TBA 10 LAIL, H W

MUS 091 Strings.<sup>AJT</sup> .5 2  
302871 07 TBA 10 LILE, J D

### PATHOLOGY

PTH 210 Independent study.<sup>A</sup> var var  
303053 01 TBA 10 KLINTWORTH, G  
303060 02 TBA 10 PIZZO, S  
303067 03 TBA 10 BIGNER, D D

PTH 357 Research in Pathology. var  
303074 01 TBA 10 BIGNER, D D  
303081 02 TBA 10 PIZZO, S  
303088 04 TBA 10 JENNINGS, R B  
303095 06 TBA 10 KOEPKE, J A  
303102 07 TBA 10 SHELburne, J D  
303109 09 TBA 10 SWENBERG, J A  
303116 10 TBA 10 HALE, L P

PTH 362 Autopsy Pathology.<sup>AP</sup> var  
303123 01 TBA 10 STAFF

PTH 367 Special Topics in Pathology. var  
303130 01 TBA 10 STAFF

### PHARMACOLOGY

PHR 210 Individual Study and  
Research.<sup>A</sup> var var  
302941 02 TBA 10 ABOU-DONIA, M B  
302948 03 TBA 10 FREMEAU, R T  
302955 19 TBA 10 SLOTKIN, T A

### PHILOSOPHY

PHL 043S Introduction to  
Philosophy.(CZ)<sup>M</sup> 1 3  
302920 01 W9.128 M-F 2:00- 3:15 15 FEREOH, M T  
PHL 048 Logic.(CZ) 1 3  
302927 01 W10.219 M-F 9:30-10:45 30 SCHMALTZ, T M  
PHL 196S Philosophy And Feminism.(CZ) 1 3  
302934 01 W9.128 MTH 7:20- 9:25 15 SCHILTZ, E A

### PHYSICAL EDUCATION

PE 011 Cardiorespiratory  
Conditioning.<sup>LT</sup> .5 2  
302878 01 W17.107 M-F 12:30- 1:45 30 BUEHLER, A G

PE 015 Weight Training.<sup>LT</sup> .5 2  
302885 01 W17 M-F 3:30- 4:45 30 FALCONE, C M  
302892 02 W17 MTH 5:00- 7:05 30 FALCONE, C M

PE 040 Beginning Tennis.<sup>LT</sup> .5 2  
302899 01 W17 M-F 9:30-10:45 20 YAKOLA, S

PE 041 Intermediate Tennis.<sup>LT</sup> .5 2  
302906 01 W17 M-F 9:30-10:45 20 YAKOLA, S

PE 172 Administration in Sports  
Management. 1 3  
302913 01 W17.107 M-F 11:00-12:15 15 BUEHLER, A G

### PHYSICAL THERAPY

PT 343 Directed Clinical Experience in  
Physical Therapy II.<sup>B</sup> 2  
303046 01 TBA 40 FISHMAN, L P

### PHYSICS

PHY 054L General Physics.(NS)<sup>FP</sup> 1 4  
302962 01 W49.113 M-F 11:00-12:15 50 EVANS, L E  
W49.102 TH 1:40- 4:15 50 EVANS, L E

PHY 055 Introduction to Astronomy.(NS)1 3  
302969 01 W49.113 M-F 8:00-9:15 40 SHAPIRO, L T

## POLITICAL SCIENCE

PS 092 Comparative Politics (B).(SS) 1 3  
302990 01 W10.311 M-F 12:30-1:45 20 DAVIDSON-SCHMIC

PS 093 Elements of International  
Relations.(D).(SS) 1 3  
302997 01 W10.311 M-F 2:00-3:15 20 RISOPP-NICKELSO

## PSYCHOLOGY

PSY 011 Introductory Psychology (G).(SS) 1 3  
303004 01 W9.127 M-F 12:30-1:45 33 CANNON, C B

PSY 097 Developmental Psychology: Introduction  
and Survey (D).(SS) 1 3  
303011 01 W9.126 M-F 11:00-12:15 20 OSWALD, K M

PSY 113A Self and Society (P).(SS)<sup>C</sup> 1 3  
ALSO TAUGHT AS: CA 141  
303018 01 W10.124 M-F 12:30-1:45 05 FRIEDMAN, J R

PSY 117 Statistical Methods (G).(QR)<sup>CT</sup> 1 3  
ALSO TAUGHT AS: SOC 133  
303025 01 W9.126 M-F 12:30-1:45 20 BUHUSI, V C

PSY 119A Abnormal Psychology (P).(SS) 1 3  
303032 01 W9.126 M-F 2:00-3:15 20 TOMLINSON, H L

PSY 170P Family Psychology 1 3  
303039 01 W9.127 M-F 2:00-3:15 15 ROCHELEAU, A E

## PUBLIC POLICY STUDIES

PPS 165 American International Economic  
Policy.(SS)<sup>CP</sup> 1 3

ALSO TAUGHT AS: ECO 165  
302976 01 W10.327 M-F 9:30-10:45 10 VINLUAN, J B

PPS 197 Marine Policy.(SS)<sup>ACX</sup> 1 3  
ALSO TAUGHT AS: ENV 276  
302983 01 TBA 10 STAFF

## RELIGION

REL 045 Religions of Asia.(CZ) 1 3  
303137 01 W3.228 M-F 11:00-12:15 30 HALMAN, H T

REL 102 The New Testament.(CZ) 1 3  
303144 01 W3.319 M-F 3:30-4:45 15 SWANCUTT, D M

## RESEARCH

RES 001 RESEARCH var var  
303151 01 TBA 100 STAFF

## SOCIOLOGY

SOC 010D Introduction to Sociology.(SS) 1 3  
303165 01 W9.129 M-F 11:00-12:15 30 STAFF

SOC 011 Contemporary Social  
Problems.(SS) 1 3  
303172 01 W9.129 MTH 7:20-9:25 25 SIMPSON, I H

SOC 133 Statistical Methods.(QR)<sup>CT</sup> 1 3  
ALSO TAUGHT AS: PSY 117  
303179 01 W9.126 M-F 12:30-1:45 15 BUHUSI, V C

## SPANISH

SP 002 Elementary Spanish.(FL)<sup>TVI</sup> 1 3  
303186 01 W5.211 M-F 9:30-10:45 22 LINHARD, T A

SP 076 Advanced Intermediate  
Spanish.(FL)<sup>PTI</sup> 1 3  
303193 01 W5.211 M-F 11:00-12:15 22 PESOLA, K A

SP 101 Advanced Composition and  
Conversation.(FL) 1 3  
303200 01 W9.129 M-F 9:30-10:45 22 LEGRAS, H E

## STATISTICS

STA 110A Statistics and Data Analysis in the  
Social Sciences.(QR) 1 3  
303207 01 W6.116 M-F 9:30-10:45 30 SWALL, J L  
W6.116 F 11:00-12:15 30 SWALL, J L

## UNIVERSITY WRITING COURSE

UWC 117S Advanced Composition I.<sup>CPT</sup> 1 3  
ALSO TAUGHT AS: ENG 117A  
303214 01 W53.306 MTH 5:00-7:05 06 RUSSELL, V G

## WOMEN'S STUDIES PROGRAM

WST 060 Gender, Social Policy, and  
Politics.(SS) 1 3  
303221 01 W6.116 M-F 3:30-4:45 25 STAFF

## ZOOLOGY

ZOO 203L Marine Ecology.<sup>CDPX</sup> 1 4  
ALSO TAUGHT AS: ENV 219L  
303228 01 TBA 06 KIRBY-SMITH, W

ZOO 274L Marine Invertebrate  
Zoology.<sup>CDPX</sup> 1 4  
ALSO TAUGHT AS: ENV 295L  
303235 01 TBA 06 DIMOCK, R V

# Summer Semester May 21-August 15

## BIOLOGY

|   |                  |            |            |
|---|------------------|------------|------------|
| <b>BIO126L Marine Mammals.(NS)</b> <sup>EPX</sup> |                  | <b>1</b>   | <b>4</b>   |
| 400155 01 TBA                                     | 25 STAFF         |            |            |
| <b>BIO191 Independent Study.</b> <sup>A</sup>     |                  | <b>1</b>   | <b>3</b>   |
| 400162 26 TBA                                     | 10 RITTSCHOF, D  |            |            |
| 400169 31 TBA                                     | 10 SIEDOW, J     |            |            |
| <b>BIO192 Independent Study.</b> <sup>A</sup>     |                  | <b>1</b>   | <b>3</b>   |
| 400176 26 TBA                                     | 10 RITTSCHOF, D  |            |            |
| <b>BIO193T Tutorial.(NS)</b> <sup>AUX</sup>       |                  | <b>var</b> | <b>var</b> |
| 400183 01 TBA                                     | 10 STAFF         |            |            |
| 400190 51 TBA                                     | 10 CRENSHAW, H C |            |            |
| <b>BIO194T Tutorial.(NS)</b> <sup>AUX</sup>       |                  | <b>var</b> | <b>var</b> |
| 400197 01 TBA                                     | 10 STAFF         |            |            |

## BOTANY

|   |          |            |  |
|---|----------|------------|--|
| <b>BOT224T Special Problems.</b> <sup>ADX</sup> |          | <b>var</b> |  |
| 400274 01 TBA                                   | 40 STAFF |            |  |
| <b>BOT225T Special Problems.</b> <sup>ADX</sup> |          | <b>var</b> |  |
| 400281 01 TBA                                   | 10 STAFF |            |  |
| <b>BOT359 Research in Botany.</b> <sup>DX</sup> |          | <b>var</b> |  |
| 400288 01 TBA                                   | 10 STAFF |            |  |
| <b>BOT360 Research in Botany.</b> <sup>DX</sup> |          | <b>var</b> |  |
| 400295 01                                       | 00 STAFF |            |  |

## CIVIL ENGINEERING

|  |                |            |            |
|--|----------------|------------|------------|
| <b>CE 265 Advanced Topics in Civil and Environmental Engineering.</b>                |                | <b>1</b>   | <b>var</b> |
| 400400 14 TBA  | 10 PEIRCE, J J |            |            |
| <b>CE 399 Special Readings in Civil and Environmental Engineering.</b> <sup>AD</sup> |                | <b>var</b> |            |
| 400407 14 TBA  | 10 PEIRCE, J J |            |            |

## COMPUTER SCIENCE

|   |          |          |  |
|---|----------|----------|--|
| <b>CPS391 Internship.</b> <sup>AD</sup> |          | <b>1</b> |  |
| 400771 01 TBA                           | 10 STAFF |          |  |

## CONTINUATION

|                            |           |  |  |
|----------------------------|-----------|--|--|
| <b>CTN001 CONTINUATION</b> |           |  |  |
| 400785 01                  | 999 STAFF |  |  |
| 400792 02 TBA              | 999 STAFF |  |  |

## ELECTRICAL ENGINEERING

|   |              |          |            |
|---|--------------|----------|------------|
| <b>EE 299 Advanced Topics in Electrical Engineering.</b> <sup>A</sup> |              | <b>1</b> | <b>var</b> |
| 400806 03 TBA   | 10 FAIR, R B |          |            |

## ENVIRONMENT

|  |                   |            |            |
|--|-------------------|------------|------------|
| <b>ENV191 Independent Study.</b> <sup>AU</sup> |                   | <b>var</b> | <b>var</b> |
| 400834 01 TBA                                  | 10 MANSFIELD, C A |            |            |
| 400841 04 TBA                                  | 10 FREEDMAN, J    |            |            |
| 400848 06 TBA                                  | 10 DIGIULIO, R T  |            |            |
| 400855 07 TBA                                  | 10 DUTROW, G F    |            |            |
| 400862 08 TBA                                  | 10 URBAN, D       |            |            |

|           |     |    |                 |
|-----------|-----|----|-----------------|
| 400869 09 | TBA | 10 | SMITH, K        |
| 400876 10 | TBA | 10 | HEATH, M S      |
| 400883 11 | TBA | 10 | SIGMON, J       |
| 400890 13 | TBA | 10 | KNOERR, K       |
| 400897 14 | TBA | 10 | KRAMER, R       |
| 400904 15 | TBA | 10 | MAGUIRE, L      |
| 400911 16 | TBA | 10 | LOBER, D        |
| 400918 17 | TBA | 10 | RECKHOW, K      |
| 400925 18 | TBA | 10 | RICHARDSON, C   |
| 400932 19 | TBA | 10 | RICHTER, D      |
| 400939 21 | TBA | 10 | KATUL, G        |
| 400946 22 | TBA | 10 | STAMBAUGH, W G  |
| 400953 24 | TBA | 10 | VESILIND, A     |
| 400960 25 | TBA | 10 | SHARMA, N       |
| 400967 26 | TBA | 10 | WEAR, D         |
| 400974 27 | TBA | 10 | CHRISTENSEN, N  |
| 400981 30 | TBA | 10 | HEALY, R G      |
| 400988 33 | TBA | 10 | TULIS, J        |
| 400995 34 | TBA | 10 | OREN, R         |
| 401002 35 | TBA | 10 | DUBAY, G R      |
| 401009 36 | TBA | 10 | PILKEY, O H     |
| 401016 39 | TBA | 10 | TERBORGH, J W   |
| 401023 40 | TBA | 10 | VANDENBERG, J   |
| 401030 44 | TBA | 10 | BARBER, R T     |
| 401037 45 | TBA | 10 | BONAVENTURA, C  |
| 401044 46 | TBA | 10 | BONAVENTURA, J  |
| 401051 47 | TBA | 10 | FORWARD, R B    |
| 401058 51 | TBA | 10 | KIRBY-SMITH, W  |
| 401065 52 | TBA | 10 | LOZIER, S       |
| 401072 53 | TBA | 10 | RAMUS, J S      |
| 401079 54 | TBA | 10 | RITTSCHOF, D    |
| 401086 58 | TBA | 10 | ORBACH, M K     |
| 401093 59 | TBA | 10 | JOHNSON, J      |
| 401100 60 | TBA | 10 | CROWDER, L B    |
| 401107 61 | TBA | 10 | READ, A J       |
| 401114 62 | TBA | 10 | MCCLELLAN-GREEN |
| 401121 63 | TBA | 10 | ROJSTACZER, S   |
| 401128 64 | TBA | 10 | MIRANDA, M L    |
| 401135 65 | TBA | 10 | AHMANN, D M     |
| 401142 66 | TBA | 10 | SNOOK, L K      |
| 401149 69 | TBA | 10 | STOW, C         |
| 401156 70 | TBA | 10 | KEOHANE, R O    |
| 401163 71 | TBA | 10 | COOPER, S       |
| 401170 72 | TBA | 10 | ROMANOWICZ, E   |
| 401177 73 | TBA | 10 | HALPIN, P N     |
| 401184 74 | TBA | 10 | MERCER, D E     |
| 401191 75 | TBA | 10 | KASIBHATLA, P   |
| 401198 76 | TBA | 10 | VASUDEVAN, D    |
| 401205 99 | TBA | 10 | STAFF           |

|  |     |            |                |
|--|-----|------------|----------------|
| <b>ENV192 Independent Study.</b> <sup>AU</sup> |     | <b>var</b> | <b>var</b>     |
| 401212 01                                      | TBA | 10         | MANSFIELD, C A |
| 401219 04                                      | TBA | 10         | FREEDMAN, J    |
| 401226 06                                      | TBA | 10         | DIGIULIO, R T  |
| 401233 07                                      | TBA | 10         | DUTROW, G F    |
| 401240 08                                      | TBA | 10         | URBAN, D       |
| 401247 09                                      | TBA | 10         | SMITH, K       |
| 401254 10                                      | TBA | 10         | HEATH, M S     |
| 401261 11                                      | TBA | 10         | SIGMON, J      |
| 401268 13                                      | TBA | 10         | KNOERR, K      |
| 401275 14                                      | TBA | 10         | KRAMER, R      |
| 401282 15                                      | TBA | 10         | MAGUIRE, L     |
| 401289 16                                      | TBA | 10         | LOBER, D       |
| 401296 17                                      | TBA | 10         | RECKHOW, K     |
| 401303 18                                      | TBA | 10         | RICHARDSON, C  |
| 401310 19                                      | TBA | 10         | RICHTER, D     |
| 401317 21                                      | TBA | 10         | KATUL, G       |
| 401324 22                                      | TBA | 10         | STAMBAUGH, W G |
| 401331 24                                      | TBA | 10         | VESILIND, A    |
| 401338 25                                      | TBA | 10         | SHARMA, N      |
| 401345 26                                      | TBA | 10         | WEAR, D        |



|           |     |    |                 |
|-----------|-----|----|-----------------|
| 401352 27 | TBA | 10 | CHRISTENSEN, N  |
| 401359 30 | TBA | 10 | HEALY, R G      |
| 401366 33 | TBA | 10 | TULIS, J        |
| 401373 34 | TBA | 10 | OREN, R         |
| 401380 35 | TBA | 10 | DUBAY, G R      |
| 401387 36 | TBA | 10 | PILKEY, O H     |
| 401394 39 | TBA | 10 | TERBORGH, J W   |
| 401401 40 | TBA | 10 | VANDENBERG, J   |
| 401408 44 | TBA | 10 | BARBER, R T     |
| 401415 45 | TBA | 10 | BONAVENTURA, C  |
| 401422 46 | TBA | 10 | BONAVENTURA, J  |
| 401429 47 | TBA | 10 | FORWARD, R B    |
| 401436 51 | TBA | 10 | KIRBY-SMITH, W  |
| 401443 52 | TBA | 10 | LOZIER, S       |
| 401450 53 | TBA | 10 | RAMUS, J S      |
| 401457 54 | TBA | 10 | RITTSCHOF, D    |
| 401464 58 | TBA | 10 | ORBACH, M K     |
| 401471 59 | TBA | 10 | JOHNSON, J      |
| 401478 60 | TBA | 10 | CROWDER, L B    |
| 401485 61 | TBA | 10 | READ, A J       |
| 401492 62 | TBA | 10 | MCCLELLAN-GREEN |
| 401499 63 | TBA | 10 | ROJSTACZER, S   |
| 401506 64 | TBA | 10 | MIRANDA, M L    |
| 401513 65 | TBA | 10 | AHMANN, D M     |
| 401520 66 | TBA | 10 | SNOOK, L K      |
| 401527 69 | TBA | 10 | STOW, C         |
| 401534 70 | TBA | 10 | KEOHANE, R O    |
| 401541 71 | TBA | 10 | COOPER, S       |
| 401548 72 | TBA | 10 | ROMANOWICZ, E   |
| 401555 73 | TBA | 10 | HALPIN, P N     |
| 401562 74 | TBA | 10 | MERCER, D E     |
| 401569 75 | TBA | 10 | KASIBHATLA, P   |
| 401576 76 | TBA | 10 | VASUDEVAN, D    |
| 401583 99 | TBA | 10 | STAFF           |

**ENV299 Independent Studies**

| and Projects. <sup>A</sup> |     | var | var             |
|----------------------------|-----|-----|-----------------|
| 401590 59                  | TBA | 10  | JOHNSON, J      |
| 401597 60                  | TBA | 10  | CROWDER, L B    |
| 401604 61                  | TBA | 10  | READ, A J       |
| 401611 62                  | TBA | 10  | MCCLELLAN-GREEN |
| 401618 63                  | TBA | 10  | ROJSTACZER, S   |
| 401625 64                  | TBA | 10  | MIRANDA, M L    |
| 401632 65                  | TBA | 10  | AHMANN, D M     |
| 401639 66                  | TBA | 10  | SNOOK, L K      |
| 401646 69                  | TBA | 10  | STOW, C         |
| 401653 70                  | TBA | 10  | KEOHANE, R O    |
| 401660 71                  | TBA | 10  | COOPER, S       |
| 401667 72                  | TBA | 10  | ROMANOWICZ, E   |
| 401674 73                  | TBA | 10  | HALPIN, P N     |
| 401681 74                  | TBA | 10  | MERCER, D E     |
| 401688 75                  | TBA | 10  | KASIBHATLA, P   |
| 401695 76                  | TBA | 10  | VASUDEVAN, D    |

**ENV399 Master's Project.<sup>ADL</sup>**

|           |     | var |
|-----------|-----|-----|
| 401702 59 | TBA | 10  |
| 401709 60 | TBA | 10  |
| 401716 61 | TBA | 10  |
| 401723 62 | TBA | 10  |
| 401730 63 | TBA | 10  |
| 401737 64 | TBA | 10  |
| 401744 65 | TBA | 10  |
| 401751 66 | TBA | 10  |
| 401758 69 | TBA | 10  |
| 401765 70 | TBA | 10  |
| 401772 71 | TBA | 10  |
| 401779 72 | TBA | 10  |
| 401786 73 | TBA | 10  |
| 401793 74 | TBA | 10  |
| 401800 75 | TBA | 10  |

|           |     |    |              |
|-----------|-----|----|--------------|
| 401807 76 | TBA | 10 | VASUDEVAN, D |
| 401814 99 | TBA | 10 | STAFF        |

**GLOBAL MBA**

|  |     |    |                |   |
|--|-----|----|----------------|---|
| <b>GBA312G Decision Models.<sup>AD</sup></b>                                     |     |    |                | 3 |
| 401933 01  | TBA | 50 | CLEMEN, R T    |   |
| <b>GBA320G Managerial Effectiveness for the Global Executive.<sup>AD</sup></b>   |     |    |                | 3 |
| 401940 01  | TBA | 50 | DESANTIS/PAYNE |   |
| <b>GBA341G Cost Management and Control in Global Organizations.<sup>AD</sup></b> |     |    |                | 3 |
| 401947 01  | TBA | 50 | ASHTON, R H    |   |
| <b>GBA370G Global Operations Management.<sup>AD</sup></b>                        |     |    |                | 3 |
| 401954 01  | TBA | 50 | ZIPKIN, P H    |   |
| <b>GBA441G International Financial Statement Analysis.<sup>AD</sup></b>          |     |    |                | 3 |
| 401961 01  | TBA | 50 | WILSON, P      |   |
| <b>GBA463G Technology, Globalization, and Competition.<sup>AD</sup></b>          |     |    |                | 3 |
| 401968 01  | TBA | 50 | MCCANN, J M    |   |

**NEW TESTAMENT**

|   |     |    |            |   |   |
|---|-----|----|------------|---|---|
| <b>NT 399 Reading in Apocalyptic<sup>AD</sup></b> |     |    |            | 1 | 3 |
| 403354 01   | TBA | 10 | EFIRD, J M |   |   |

**NURSING**

|   |            |            |                 |               |
|---|------------|------------|-----------------|---------------|
| <b>NUR303 Issues in Contemporary Health Care Organizations.<sup>D</sup></b>   |            |            |                 | 3             |
| 403361 01   | MSN.1017 W | 1:00-4:00  | 99              | FRIEDMAN, B J |
| <b>NUR308 Applied Statistics.<sup>DPS</sup></b>                               |            |            |                 | 2             |
| 403368 01   | TBA        | 30         | CHAMPAGNE, M T  |               |
| <b>NUR312 Research Utilization in Advanced Nursing Practice.<sup>DP</sup></b> |            |            |                 | 3             |
| 403375 01   | MSN.1017 T | 9:00-12:00 | 99              | WALLSTEN, S   |
| <b>NUR313 Thesis.<sup>D</sup></b>   |            |            |                 | var           |
| 403382 02   | TBA        | 10         | ALLRED, C       |               |
| 403389 03   | TBA        | 10         | HAWTHORNE, M H  |               |
| 403396 04   | TBA        | 10         | DENMAN, S       |               |
| 403403 05   | TBA        | 10         | MCINTIRE, A S N |               |
| 403410 06   | TBA        | 10         | MCCONNELL, E S  |               |
| 403417 07   | TBA        | 10         | CHAMPAGNE, M T  |               |
| 403424 08   | TBA        | 10         | WALLSTEN, S     |               |
| 403431 09   | TBA        | 10         | GOODWIN, L      |               |
| 403438 10   | TBA        | 10         | BOZZETTE        |               |
| 403445 11   | TBA        | 10         | BLOOD-SIEGFRIED |               |
| 403452 12   | TBA        | 10         | OEHLER, J M     |               |
| 403459 13   | TBA        | 10         | TURNER, B S     |               |
| 403466 14   | TBA        | 10         | FRIEDMAN, B J   |               |
| 403473 15   | TBA        | 10         | CHEEK           |               |
| 403480 16   | TBA        | 10         | MCHUGH          |               |

|   |     |    |                 |     |
|---|-----|----|-----------------|-----|
| <b>NUR314 Nonthesis Option.<sup>D</sup></b> |     |    |                 | var |
| 403487 02                                   | TBA | 10 | ALLRED, C       |     |
| 403494 03                                   | TBA | 10 | HAWTHORNE, M H  |     |
| 403501 04                                   | TBA | 10 | HEWITT, D N     |     |
| 403508 05                                   | TBA | 10 | MCINTIRE, A S N |     |
| 403515 06                                   | TBA | 10 | WILKMAN, M      |     |
| 403522 07                                   | TBA | 10 | CHAMPAGNE, M T  |     |
| 403529 08                                   | TBA | 10 | WALLSTEN, S     |     |
| 403536 09                                   | TBA | 10 | OUIMETTE, R M   |     |
| 403543 10                                   | TBA | 10 | BOZZETTE        |     |
| 403550 11                                   | TBA | 10 | BLOOD-SIEGFRIED |     |
| 403557 12                                   | TBA | 10 | OEHLER, J M     |     |

|           |     |    |                |
|-----------|-----|----|----------------|
| 403564 13 | TBA | 10 | TURNER, B S    |
| 403571 14 | TBA | 10 | FRIEDMAN, B J  |
| 403578 15 | TBA | 10 | DENMAN, S      |
| 403585 16 | TBA | 10 | LORIMER        |
| 403592 17 | TBA | 10 | GOODWIN, C     |
| 403599 18 | TBA | 10 | MCCONNELL, E S |
| 403606 19 | TBA | 10 | MESSICK        |
| 403613 20 | TBA | 10 | APINOLFI       |
| 403620 21 | TBA | 10 | CHEEK          |
| 403627 22 | TBA | 10 | MCHUGH         |
| 403634 23 | TBA | 10 | SANFORD        |
| 403641 24 | TBA | 10 | PIETRANGELO    |

**NUR324 Nurse Practitioner Residency:**

|                         |     |    |        |
|-------------------------|-----|----|--------|
| Neonatal. <sup>DP</sup> |     |    | var    |
| 403648 01               | TBA | 10 | TURNER |

**NUR326 Nurse Practitioner Residency:**

|                                   |     |    |       |
|-----------------------------------|-----|----|-------|
| Adult Primary Care. <sup>DP</sup> |     |    | var   |
| 403655 01                         | TBA | 10 | STAFF |

**NUR328 Care Management of Patients with**

|  |            |            |          |
|--|------------|------------|----------|
| Selected Cardiovascular Illnesses. <sup>DP</sup> |            |            | 3        |
| 403662 01  | MSN.1002 T | 1:00- 4:00 | 10 CHEEK |

**NUR329 Nurse Practitioner Residency: Adult**

|                               |     |    |       |
|-------------------------------|-----|----|-------|
| Cardiovascular. <sup>DP</sup> |     |    | var   |
| 403669 01                     | TBA | 10 | CHEEK |

**NUR332 Oncology Nursing II: Symptom and**

|                                   |            |            |                    |
|-----------------------------------|------------|------------|--------------------|
| Problem Management. <sup>DP</sup> |            |            | var                |
| 403676 01                         | MSN.1043 W | 1:00- 4:00 | 10 MCINTIRE, A S N |

**NUR334 Clinical Nurse Specialist Residency:**

|                         |     |    |                 |
|-------------------------|-----|----|-----------------|
| Oncology. <sup>DP</sup> |     |    | 3               |
| 403683 01               | TBA | 10 | MCINTIRE, A S N |

**NUR335 Nurse Practitioner Residency: Adult**

|                                  |     |    |                 |
|----------------------------------|-----|----|-----------------|
| Oncology/HIV AIDS. <sup>DP</sup> |     |    | var             |
| 403690 01                        | TBA | 30 | MCINTIRE, A S N |

**NUR345 Nursing Administration**

|                          |           |            |            |
|--------------------------|-----------|------------|------------|
| Residency. <sup>DP</sup> |           |            | var        |
| 403697 01                | MHH.137 W | 1:00- 4:00 | 35 ALLRED, |

**NUR346 Entrepreneurial Ventures**

|                          |     |    |       |
|--------------------------|-----|----|-------|
| in Nursing. <sup>D</sup> |     |    | 3     |
| 403704 01                | TBA | 25 | STAFF |

**NUR347 Informatics Issues in Nursing**

|                        |     |    |         |
|------------------------|-----|----|---------|
| Systems. <sup>DP</sup> |     |    | 2       |
| 403711 01              | TBA | 15 | GOODWIN |

**NUR352 Diagnostic Reasoning and Physical**

|                                |  |  |   |
|--------------------------------|--|--|---|
| Assessment in Advanced Nursing |  |  |   |
| Practice. <sup>DEJS</sup>      |  |  | 4 |

|           |              |    |         |
|-----------|--------------|----|---------|
| 403718 01 | H 1:30- 4:30 | 25 | WICKMAN |
|-----------|--------------|----|---------|

|  |              |    |         |
|--|--------------|----|---------|
|  | H 5:30- 8:30 | 25 | WICKMAN |
|--|--------------|----|---------|

**NUR355 Managing Common Acute and Chronic**

|                                   |            |            |                  |
|-----------------------------------|------------|------------|------------------|
| Health Problems II. <sup>DP</sup> |            |            | 4                |
| 403725 01                         | MSN.1017 W | 9:00-12:00 | 99 DENMAN/QUIMET |

**NUR358 Advanced Physiology.<sup>DP</sup>**

|           |            |            |           |
|-----------|------------|------------|-----------|
| 403732 01 | MSN.1046 H | 9:00-12:00 | 40 MCHUGH |
|-----------|------------|------------|-----------|

**NUR360 Concepts of Teaching and**

|                        |            |            |             |
|------------------------|------------|------------|-------------|
| Learning. <sup>D</sup> |            |            | 3           |
| 403739 01              | MSN.1043 H | 9:00-12:00 | 15 MCINTIRE |

**NUR362 Ethics in Nursing.<sup>D</sup>**

|           |     |    |        |
|-----------|-----|----|--------|
| 403746 01 | TBA | 20 | COOPER |
|-----------|-----|----|--------|

**NUR365 Nurse Practitioner Residency:**

|                                 |     |    |       |
|---------------------------------|-----|----|-------|
| Adult Acute Care. <sup>DP</sup> |     |    | var   |
| 403753 01                       | TBA | 20 | STAFF |

**NUR375 Nurse Practitioner Residency:**

|                            |     |    |          |
|----------------------------|-----|----|----------|
| Gerontology. <sup>DP</sup> |     |    | var      |
| 403760 01                  | TBA | 30 | WALLSTEN |

**NUR382 Common Pediatric Management**

|                          |            |            |                   |
|--------------------------|------------|------------|-------------------|
| Issues II. <sup>DP</sup> |            |            | 4                 |
| 403767 01                | MSN.1043 T | 1:00- 4:00 | 20 BLOOD-SIEGRIED |

**NUR383 Clinical Nurse Specialist Practicum:**

|                           |     |    |                 |
|---------------------------|-----|----|-----------------|
| Pediatrics. <sup>DP</sup> |     |    | 3               |
| 403774 01                 | TBA | 10 | BLOOD-SIEG/LORI |

**NUR385 Advanced Nursing Care**

|                            |            |            |                   |
|----------------------------|------------|------------|-------------------|
| of Children. <sup>DP</sup> |            |            | 3                 |
| 403781 01                  | MSN.1043 W | 9:00-12:00 | 25 BLOOD-SIEGRIED |

**NUR386 Nurse Practitioner Residency:**

|                           |     |    |                 |
|---------------------------|-----|----|-----------------|
| Pediatrics. <sup>DP</sup> |     |    | var             |
| 403788 01                 | TBA | 10 | BLOOD-SIEG/LORI |

**NUR388 Physiological Monitoring.<sup>D</sup>**

|           |           |            |           |
|-----------|-----------|------------|-----------|
| 403795 01 | MHH.137 W | 9:00-12:00 | 10 TURNER |
|-----------|-----------|------------|-----------|

**NUR392 Well Child Physical and Developmental****Assessment for Family**

|                                    |              |            |                    |
|------------------------------------|--------------|------------|--------------------|
| Nurse Practitioners. <sup>DP</sup> |              |            | 1                  |
| 403802 01                          | MSN.1017 W   | 4:00- 6:00 | 50 FRIEDMAN/MESSIC |
| 403809 02                          | H 0:00- 0:00 | 25         | FRIEDMAN/SANFOR    |

**NUR395 Nurse Practitioner Residency:**

|                       |     |    |          |
|-----------------------|-----|----|----------|
| Family. <sup>DP</sup> |     |    | var      |
| 403816 01             | TBA | 30 | FRIEDMAN |

**NUR399 Selected Topics or Independent****Study.<sup>ADP</sup>**

|           |     |     |                 |
|-----------|-----|-----|-----------------|
|           |     |     | var             |
| 403823 01 | TBA | 10  | ALLRED, C       |
| 403830 02 | TBA | 10  | BOZZETTE        |
| 403837 03 | TBA | 10  | HAWTHORNE, M H  |
| 403844 04 | TBA | 10  | HEWITT, D W     |
| 403851 05 | TBA | 10  | MCINTIRE, A S N |
| 403858 06 | TBA | 10  | WILKMAN, M      |
| 403865 07 | TBA | 10  | CHAMPAGNE, M T  |
| 403872 08 | TBA | 10  | WALLSTEN, S     |
| 403879 09 | TBA | 10  | OUTMETTE, R M   |
| 403886 10 | TBA | 10  | CHEEK           |
| 403893 11 | TBA | 100 | BLOOD-SIEGRIED  |
| 403900 12 | TBA | 10  | OEHLER, J M     |
| 403907 13 | TBA | 10  | TURNER, B S     |
| 403914 14 | TBA | 10  | FRIEDMAN, B J   |
| 403921 15 | TBA | 10  | DENMAN, S       |
| 403928 16 | TBA | 10  | LORIMER         |
| 403935 17 | TBA | 10  | GOODWIN, C      |
| 403942 18 | TBA | 10  | MCCONNELL, E S  |
| 403949 19 | TBA | 10  | MESSICK         |
| 403956 20 | TBA | 10  | PRICE, M        |
| 403963 21 | TBA | 10  | APINOLFI        |
| 403970 23 | TBA | 10  | MCHUGH          |
| 403977 24 | TBA | 10  | SANFORD         |
| 403984 25 | TBA | 10  | PIETRANGELO     |

**PATHOLOGY****PTH357 Research in Pathology.<sup>A</sup>**

|           |     |    |                |
|-----------|-----|----|----------------|
| 406028 01 | TBA | 10 | BIGNER, D D    |
| 406035 02 | TBA | 10 | PIZZO, S       |
| 406042 07 | TBA | 10 | SHELBURNE, J D |
| 406049 09 | TBA | 10 | SWENBURG, J A  |

**PTH362 Autopsy Pathology.<sup>ADP</sup>**

|           |     |    |       |
|-----------|-----|----|-------|
| 406056 01 | TBA | 10 | STAFF |
|-----------|-----|----|-------|

**PTH367 Special Topics in Pathology.<sup>D</sup>**

|           |     |    |       |
|-----------|-----|----|-------|
| 406063 01 | TBA | 10 | STAFF |
|-----------|-----|----|-------|

**PTH380 Diagnostic Immunology.<sup>AD</sup>**

|           |     |    |       |
|-----------|-----|----|-------|
| 406070 01 | TBA | 40 | STAFF |
|-----------|-----|----|-------|

**PHARMACOLOGY**

PHR372 Research in Pharmacology. var  
405314 01 TBA 10 STAFF

**PUBLIC POLICY STUDIES**

PPS148S Environmental Policy, Summer Internship. ALPS var var  
405356 01 TBA 18 STAFF

PPS152S Administration of Justice, Summer Internship. ALPS var var  
405363 01 TBA 18 STAFF

PPS155S Free Press and Public Policy, Summer Internship. ALPS var var  
405370 01 00 STAFF

PPS158S Health Policy, Summer Internship. ALPS var var  
405377 01 TBA 18 STAFF

PPS161S State and Local Public Policy, Summer Internship. ALPS var var  
405384 01 TBA 18 STAFF

PPS164S Telecommunications Policy, Summer Internship. ALPS var var  
405391 01 TBA 18 STAFF

PPS168S International Policy, Summer Internship. ALPS var var  
405398 01 TBA 18 STAFF

PS190 Internship. ALPS 1 3  
405405 01 TBA 40 STAFF

**RESEARCH**

RES001 RESEARCH var  
406336 01 TBA 999 STAFF

**ZOOLOGY**

ZOO353 Research. ACD var  
407281 01 TBA 10 STAFF  
407288 08 TBA 10 FORWARD, R B

ZOO354 Research. ACDX var  
407295 01 TBA 10 STAFF

ZOO360 Tutorials. var  
407302 01 TBA 10 STAFF

ZOO360T TUTORIAL. ADX var  
407309 01 TBA 10 STAFF  
407316 26 TBA 10 RITTSCHOF, D  
407323 68 TBA 10 MOTTEN, A

ZOO361T TUTORIAL. ADX var  
407330 01 TBA 10 STAFF



## **Course Descriptions for Summer Session 1998**

### **Arts and Sciences**

#### **African and African-American Studies (AAS)**

**124S. Slave Society in Colonial Anglo-America: The West Indies, South Carolina, and Virginia. (CZ)** See C-L: History 124S; also C-L: Comparative Area Studies. One course.

#### **Art History (ARH)**

**69, 70. Introduction to the History of Art. (AL)** The history of western architecture, sculpture, and painting in a cultural context. 69: from prehistory to the Renaissance (c. 1400). 70: from the Renaissance to the present. One course each.

**189. Modern and Postmodern Architecture. (AL)** The history of architecture from nineteenth-century Beaux-Arts classicism through art nouveau and the modern movement to postmodernism. Political and ideological as well as the formal and technical aspects of building investigated through primary texts. C-L: Perspectives on Marxism and Society. One course.

#### **Asian and African Languages and Literature (AAL)**

**165S. Modern Arabic Literature in Translation. (AL)** Novels and short fiction from Egypt, Lebanon, Sudan, Palestine, North Africa, and the Arabian peninsula. Issues of identity formation in postcolonial societies, gender construction, and representation of conflict. C-L: Comparative Area Studies. One course.

#### **Arabic (ARB)**

**1, 2. Elementary Arabic. (FL)** Understanding, speaking, reading, and writing modern standard Arabic. Language laboratory. One course each.

#### **Biological Anthropology and Anatomy (BAA)**

**93. Introduction to Biological Anthropology. (NS)** Origins and distribution; primate evolution; a survey of human paleontology and human biology, prehistory, and language; and the origins of human social organization and culture. One course.

**132. Human Evolution. (NS)** Evolutionary biology of the primates. Anatomical and behavioral adaptations and phylogeny of fossils and living primates including *Homo sapiens*. Prerequisites: Biological Anthropology and Anatomy 93 or equivalent. One course.

#### **Biology (BIO)**

**43D. Ecology and Society. (NS)** Ecological concepts and their application to human society. Intended for nonscience majors. One course.

**118. Principles of Genetics and Cell Biology I. (NS)** Structure and function of genes and proteins in organisms ranging from bacteria to humans. Topics include: physical properties of DNA and chromosomes; protein structure and function; transcription and translation of genetic information; segregation, recombination, and linkage of genes; evolution of genes and proteins; identification and cloning of genes; regulation of gene expression; postranslational control of protein function; manipulating protein expression and function through genetic engineering. Prerequisites: Biology 25L and Chemistry 12L. C-L: Genetics. One course.



## Chemistry (CHM)

**11L, 12L. Principles of Chemistry. (NS)** The introductory course for students who intend to take additional chemistry courses other than Chemistry 83. 11L: emphasizes stoichiometry and atomic and molecular structures. 12L: emphasizes thermodynamics, chemical kinetics, synthesis, and analysis. Laboratory work includes both qualitative and quantitative analysis. Prerequisites: one year of high school chemistry or consent of instructor; Mathematics 19 or its equivalent; and for 12L: Chemistry 11L. One course each.

**23L. Advanced General Chemistry. (NS)** An intensive introductory course for well-prepared students, covering in one semester the major topics of Chemistry 11L and 12L. Laboratory work includes both qualitative and quantitative analysis. Students may not receive credit for both Chemistry 23L and Chemistry 11L, 12L or Chemistry 31S. Prerequisites: Mathematics 19 or its equivalent; and two years of high school chemistry or consent of instructor. One course.

**151L, 152L. Organic Chemistry. (NS)** The structures and reactions of the compounds of carbon. Laboratory: techniques of separation, organic reactions and preparations, and systematic identification of compounds by their spectral and chemical properties. Prerequisite: Chemistry 12L, 23L, or 31S or consent of director of undergraduate studies; for 152L: Chemistry 151L. One course each.

## Classical Studies (CS)

**11S. Greek Civilization. (CZ)** The culture of the ancient Greeks from the Bronze Age to Alexander the Great: art, literature, history, philosophy, and religion. One course.

**12S. Roman Civilization. (CZ)** The culture of the ancient Romans from their beginnings to Constantine: art, literature, history, philosophy, and religion. One course.

**117. Ancient Myth in Literature. (AL)** Myth in classical and medieval writers from Hesiod to Boccaccio. C-L: Medieval and Renaissance Studies. One course.

**180. Special Topics in Classical Studies.** Topics to be announced. One course.

## Computer Science (CPS)

**1. Computer Science Fundamentals. (QR)** An overview for students not intending to major in computer science. Computer programming, symbolic and numeric computation, electric circuits, architectures, translation, time complexity, noncomputability, and artificial intelligence. Not open to students having credit for Computer Science 6 or higher. One course.

**4. Introduction to Programming. (QR)** A study of clear thinking and problem solving using the computer. Representation, problem decomposition, and structured or object oriented programming. Students learn a modern computer language and develop skills by solving a variety of symbolic and numerical problems. Not intended as an introduction to the major. One course.

**6. Introduction to Program Design and Analysis I. (QR)** Problem-solving techniques using a computer, top-down decomposition and object-oriented solution methodologies, introduction to programming, programming in the C/C++ language, introduction to UNIX and programming environments, recursion, analysis of execution times, linked data structures, searching, and sorting. Normally the first course for majors in computer science who have no programming experience. One course.

## Cultural Anthropology (CA)

**141. Self and Society. (SS)** The nature of human social identities, the contexts in which they are shaped, and the processes by which they change. C-L: Psychology 113A and Women's Studies. One course.

**180S. Current Issues in Anthropology. (SS)** Same as Cultural Anthropology 180 except instruction is provided in seminar format. One course.

## **Drama (DRA)**

**99S. Introduction to Performance. (AL)** Storytelling and exploration of the self including: movement, voice, imaginative work, and the basic actor's vocabulary. Scene work. The process of acting will be studied from in-class work and observation of Drama Program productions. Course geared to the student with little or no experience in acting. One course.

**131S. Acting. (AL)** Text analysis from the actor's point of view, preparation, emotional technique, voice, and movement. Scene work with focus on modern and contemporary texts. Not open to students who have taken the former Drama 101S. Consent of instructor required. One course.

**174. Studies in Film History. (AL)** See C-L: English 185; also C-L: Film and Video and Literature 116. One course.

**182, 183. Shakespeare. (AL)** Not open to students who have taken Drama 115, 116. See C-L: English 143, 144; also C-L: Medieval and Renaissance Studies. One course each.

## **Economics (ECO)**

**1D. National Income and Public Policy. (SS)** Basic economic analysis emphasizing current public policy issues. Means of determining the level and rate of growth of aggregate national income and output. Causes of unemployment, inflation, and international payment problems. The effects of monetary policy (money supply and interest rates) and fiscal policy (government expenditures and taxes) on these problems. For freshmen; upperclassmen by consent of instructor. One course.

**2D. Competition, Monopoly, and Welfare. (SS)** The composition of output and the distribution of income in a market economy. Role of government. Contemporary problems. Topics such as environmental economics, monopoly, unionism, international trade. Comparison of a market economy with other systems of economic organization. Economic problems of developing countries. Open only to freshmen. C-L: Health Policy. One course.

**51D. National Income and Public Policy. (SS)** For description see Economics 1D. Open to all students. May be taken before or after Economics 2D or 52D. One course.

**52D. Competition, Monopoly, and Welfare. (SS)** For description see Economics 2D. Open to all students. May be taken before or after Economics 1D or 51D. C-L: Health Policy. One course.

**83. Financial Accounting and Decision Making. (SS)** The accounting model of the firm, transaction analysis, the use of accounting information by management. Topics include procedures to process accounting data, income determination, financial statement analysis, cost behavior, budgeting, and short-run decisions. Not open to students who have taken Management Sciences 53. Does not count for economics major or minor requirements. One course.

**139. Introduction to Econometrics. (QR)** Data collection, estimation, and hypothesis testing. Use of econometric models for analysis and policy. Prerequisites: Economics 2 or 52, Mathematics 32 or equivalent, and statistics. One course.

**149. Microeconomics. (SS)** Cost and supply considerations in price theory; the demand for factors of production. The allocation of resources in the context of competitive and monopolistic market structures. Not open to students who have had Public Policy Studies 110. Prerequisites: Economics 2 or 52, and Mathematics 26L or 31 or 31L. One course.

**153. Money and Banking. (SS)** The evolution and operations of commercial and central banking and nonbanking financial institutions in the United States, the determination of monetary aggregates and interest rates, the financial impacts of Treasury operations, and the linkages from Federal Reserve actions to price level, employment, economic growth, and balance of payments objectives. Prerequisite: Economics 154. One course.

**154. Macroeconomics. (SS)** Concepts and measurement of national income and expenditures, employment, interest rates, and price levels; the theoretical determination of these aggregates; applications of macroeconomic theory to business cycles and economic growth. Prerequisites: Economics 1 or 51, 2 or 52, and Mathematics 26L or 31 or 31L. One course.

**158. Financial Markets and Investments. (SS)** The tools learned in microeconomics, macroeconomics, basic mathematics, and statistics applied to problems in financial economics. A blend of pure economic theory, an investigation of financial data, and practical applications using personal computers. Prerequisites: Economics 149, Economics 154, and a statistics course—preferably Statistics 110B or 210B. One course.

**165. American International Economic Policy. (SS)** Topics include United States trade policies and protectionism, the North American Free Trade area, trade and economic relations with industrialized countries, policies toward developing countries and multilateral institutions, macroeconomic policy coordination, and relations with Europe. Prerequisites: Economics 1 or 51 and 2 or 52. C-L: Public Policy Studies 165. One course.

**173. Economics of Organization and Management. (SS)** Coordination and motivation issues within a corporation along with the internal design and dynamics of organizations. Topics include the structure of employment contracts, performance incentives, and the pricing of financial assets. Prerequisite: Economics 149. One course.

**181. Corporate Finance. (SS)** Major corporate decisions from the perspective of the firm with an emphasis on the interaction of the firm with financial markets: project evaluation for investment, choice between borrowing and issuing stock, dividend policy, organizational form (for example, mergers and acquisitions). Introduction to financial markets: issuing stocks, analyzing financial performance, and options. Prerequisites: Economics 1 or 51, 2 or 52; Economics 149 and some statistics recommended. One course.

**187. Public Finance. (SS)** Economic aspects of the allocative and distributive role of government in the economy, the incidence and efficiency of taxation, the effects of taxation on behavior, and analysis of major government spending programs. Prerequisite: Economics 149. One course.

**199. Distributive Justice and the Social Sciences. (SS)** Welfarism: classical utilitarianism versus egalitarianism (Harsanyi versus Rawls). Democratic rights: voting rules and preference aggregation (Arrow's theorem). Liberalism: competitive equilibrium, destructive competition, and inefficient decentralization. Welfarism versus resourceism. Mechanism design and the microeconomic approach to justice. Prerequisites: Economics 1 or 51 and Economics 2 or 52. C-L: Political Science 175A. One course.

**239. Introduction to Econometrics. (QR)** Data collection, estimation, and hypothesis testing. Use of econometric models for analysis and policy. (Same as Economics 139 but requires additional term paper; not open to students who have taken Economics 139.) Prerequisites: Economics 2 or 52 and Mathematics 32 or equivalent and Statistics 110B. One course.

**249. Microeconomics. (SS)** Cost and supply considerations in price theory; the demand for factors of production. The allocation of resources in the context of



competitive and monopolistic market structures. (Similar to Economics 149 but at a more advanced level; not open to students who have taken Economics 149.) One course.

**254. Macroeconomics. (SS)** Concepts and measurement of national income and expenditures, employment, interest rates, and price levels; the theoretical determination of these aggregates; applications of macroeconomic theory to business cycles and economic growth. (Similar to Economics 154 but at a more advanced level; not open to students who have taken Economics 154.) One course.

## **Education (EDU)**

**100. Social and Philosophical Foundations of Education. (SS)** Basic features and assumptions, viewpoints, and issues of education in contemporary America. C-L: Perspectives on Marxism and Society. One course.

**108S. Teaching Practices in Elementary Language Arts and Content Areas. (SS)** Research, theories, and practices of language arts, social studies, science, and mathematics instruction in the elementary school. Introduction to appropriate strategies and methodologies that reflect proven educational practices and research. A planned, sequential field-based experience in a model public school is provided. One course.

**117S. Psychology of Personal and Social Adjustment. (SS)** Principles of mental health affecting individual and social adjustments. One course.

**118. Educational Psychology. (SS)** Emotional and cognitive learning in children, youth, and adults. One course.

**121. Infancy, Early Childhood, and Educational Programs. (SS)** Developmental theories and their practical application in education. Emphasis on parenting and teaching. One course.

**140. The Psychology of Work. (SS)** Factors affecting career choice and change. One course.

**149S. Exceptional Children. (SS)** Etiology and assessment of major types of exceptionalities, including intellectual abilities, physical or emotional handicaps, and sensorially impaired. Family relationships and treatment programs. One course.

**209. Global Education. (SS)** A comparative survey of major educational changes and reforms in selected countries designed to illustrate general similarities and differences in the policies of developing and industrialized societies. Emphasis on American educational issues in the context of the emerging global economy. One course.

**211. Education and the Mass Media. (SS)** Impact of mass media on behavior, particularly of children. One course.

## **English (ENG)**

**63S. Introduction to Creative Writing. (AL)** One course.

**90. Reading Critically: Poetry, Fiction, Drama. (AL)** An introduction to the skills of critical reading and the vocabulary of critical analysis by close examination of poetry, fiction, and drama from a range of historical periods. A handbook or comparable guide to critical terms will be assigned. One course.

**90S. Reading Critically: Poetry, Fiction, Drama. (AL)** A seminar version of English 90. One course.

**91. Reading Critically: Chaucer, Shakespeare, Milton, Pope. (AL)** An introduction to the skills of critical reading and the vocabulary of critical analysis by close examination of the works of Chaucer, Shakespeare (or occasionally Spenser), Milton, and Pope. Focus on the acquisition of critical skills through analyzing the works of



authors closely linked with the making of the dominant traditions of English poetry. A handbook or comparable guide to critical terms will be assigned. One course.

**117A, S. Advanced Composition I.** See C-L: University Writing Course 117S. One course.

**137. Nineteenth-Century British Novel.** (AL) Scott, Austen, Dickens, Thackeray, Trollope, the Brontës, George Eliot, Meredith, Butler, Hardy, and others. Not open to students who have taken English 132A. One course.

**143, 144. Shakespeare.** (AL) 143: twelve plays before 1600. 144: usually ten plays after 1600. Not open to students who have taken Drama 115, 116. C-L: Drama 182, 183 and Medieval and Renaissance Studies. One course each.

**154. American Literature: 1915 to 1960.** (AL) Eliot, Fitzgerald, Hemingway, Faulkner, and others. Not open to students who have taken English 52. One course.

**155. Contemporary American Writers.** (AL) Novelists and poets prominent since 1960. One course.

**169S. Special Topics in American Literature.** (AL) One course.

**170. Special Topics in Genre.** (AL) One course.

**185. Studies in Film History.** (AL) Close examination of a particular issue, period, national cinema, or technological development. C-L: Drama 174, Film and Video, and Literature 116. One course.

**275. American Literature since 1915.** (AL) Selected topics. One course.

## French (FR)

**1-2. Elementary French.** (FL) Understanding, speaking, reading, and writing French. Language laboratory for recording-listening practice. Two courses.

**63. Intermediate French.** (FL) Grammar review, reading, and oral practice, including laboratory experience. Prerequisite: French 2, 12, or achievement or placement test score of 450-540. One course.

**76. Advanced Intermediate French.** (FL) Oral practice, reading, composition. Prerequisite: French 63 or achievement or placement test score of 550-590. One course.

**141S, 142S. French Literature.** (AL, FL) Topics to be announced. Open to juniors and seniors. One course each.

## Geology (GEO)

**41. The Dynamic Earth.** (NS) Dynamic systems studied include volcanoes, earthquakes, sea-floor spreading, plate tectonics; surficial processes such as floods, glaciers, landslides, and related phenomena; and the composition of the earth including rocks and minerals. One course.

## German (GER)

**1-2. First-Year German: Introduction to German Language and Culture.** (FL) Four-skill (understanding, speaking, reading, writing) communicative approach to the language of everyday life in German-speaking countries, the language of their histories and societies, their arts and letters. Resources include audio, video, and computer-based materials. Two courses.

**14. Intensive German.** (FL) Accelerated introduction to German, combining in one semester the work of German 1-2. Classroom theory and practice with extended exposure to language laboratory and computer programmed instruction. Consent of director of undergraduate studies required. Two courses.

**69. Accelerated Intermediate German.** (FL) Emphasis on utilizing grammatical structures in meaningful contexts, further development of reading, listening, speaking,

and writing skills. Literary and nonliterary texts from a variety of media provide material for additional insight into German culture. Students desiring in-depth grammar explanations should consider taking German 65-66 (Intermediate German) instead. One course.

### **Greek (GRK)**

**14S. Intensive Elementary Greek. (FL)** Introduction to the grammar, offered only in the summer; combining the work of Greek 1 and 2 in one course. Two courses.

**15S. Intensive Intermediate Greek. (FL)** Combining the work of Greek 63 and 64 in one course, offered only in the summer; selected readings in prose and poetry. Two courses.

### **Health, Physical Education, and Recreation (PE)**

**11. Cardiorespiratory Conditioning.** Individualized programs in walking, jogging, running, cycling, and swimming. Half course.

**14. Stress Management and Performance Enhancement.** Visualization, imagery, and relaxation techniques. Mind-body medicine approaches to life-style change. Sports psychology theories. Half course.

**15. Weight Training.** Progressive, cumulative, and measurable physical conditioning. Half course.

**17. Mountain Biking.** Individualized programs in mountain biking including bike maintenance, safety tips, single- and multi-track riding. Half course.

**40. Beginning Tennis.** Half course.

**41. Intermediate Tennis.** Strategy of the game and stroke development. Half course.

**170. History and Issues of Sports.** Sports from ancient to modern times with an emphasis on sports in America. Not open to students who have taken this course as Health, Physical Education, and Recreation 49S. One course.

**172. Administration in Sports Management.** Philosophy, financial structure, administrative structure, fund-raising, NCAA legislation, personnel decision, and scheduling events. One course.

**174. Sports Marketing of Collegiate Athletic Events.** Philosophy, marketing strategies, planning, and problem solving in promoting collegiate athletic events. One course.

### **History (HST)**

**22S. Europe from the Eighteenth Century. (CZ)** A seminar version of History 22. One course.

**92. America from 1877 to the Present. (CZ)** A general introduction to American history from the end of Reconstruction to the present. The impact of industrialization, immigration, urbanization, and the rise of mass culture in the United States; the effect of depressions and wars on American society and politics; and the roots and results of reform movements ranging from populism and progressivism to the civil rights, women's, and environmental movements. Ongoing debates about the government's proper economic and social role; changing views of ethnicity, race, and gender in America, and the determinants of United States foreign policy. One course.

**101C. Terrorism, 1848-1968. (CZ)** A comparative analysis of the origins and development of modern terrorism in the West (Europe, Russia, and the United States). C-L: Comparative Area Studies. One course.

**105S, 106S. Seminars in Selected Topics. (CZ)** One course each.

**110. History of Eastern Europe in Modern Times. (CZ)** The development of the nations and nationalities of Eastern Europe since the early eighteenth century. C-L: Comparative Area Studies. One course.

**112A, 112B. The World in the Twentieth Century. (CZ)** Imperialism and decolonization, war, revolution, international capitalism and depression, science and technology. 112A: 1900 to 1945; 112B: 1945 to the present. C-L: Comparative Area Studies. One course each.

**120. History of Socialism and Communism. (CZ)** The origins and development of socialist and communist movements from pre-Marxian times to the present. Not open to students who have taken History 239. C-L: Comparative Area Studies. One course.

**123S. Madness and Society in Historical Perspective. (SS)** Mental illness and psychiatric treatment from antiquity to the present with special concentration on the nineteenth and twentieth centuries in Europe, America, and Russia. C-L: Comparative Area Studies. One course.

**124S. Slave Society in Colonial Anglo-America: The West Indies, South Carolina, and Virginia. (CZ)** The development of slave-based societies and the production of staple crops for export. C-L: African and African-American Studies 124S and Comparative Area Studies. One course.

**160. The United States from the New Deal to the Present. (CZ)** C-L: Women's Studies. One course.

**195S, 196S. Junior-Senior Seminars in Special Topics. (CZ)** Opportunities for juniors and seniors to research and write about a specific historical question. Topics are numerous and vary each semester. Most seminars are offered for one semester and carry one course credit; some seminars are offered for year-long study and carry two course credits. If students wish to enroll in only one semester of a year-long seminar, they must obtain permission from the instructor. Both history majors and nonmajors may enroll in the seminars during their junior or senior years. Students are urged to enroll in their junior year if they expect to apply for the Senior Honors Seminar (History 197S-198S) or to practice-teach in their senior year. One course each.

**239. History of Socialism and Communism. (CZ)** The origins and development of socialist and communist movements from pre-Marxian times to the present. Not open to students who have taken History 120. C-L: Comparative Area Studies. One course.

**299S. Special Topics. (CZ)** Seminars in advanced topics, designed for seniors and graduate students. Some semesters open to seniors and graduate students; some semesters limited to graduate students only. One course.

## **Italian (IT)**

**1-2. Elementary Italian. (FL)** Understanding, speaking, reading, and writing Italian. Language laboratory available for recording-listening practice. Two courses.

## **Latin (LAT)**

**14S. Intensive Elementary Latin. (FL)** Introduction to the grammar, offered only in the summer; combining the work of Latin 1 and 2 in one course. Two courses.

**15S. Intensive Intermediate Latin. (FL)** Combining the work of Latin 63 and 64 in one course, offered only in the summer; selected readings in prose and poetry. Two courses.

## **Literature (LIT)**

**20S. Introduction to Literature. (AL)** Introduction to the study of literature and other forms of cultural expression, such as film. Different introductory approaches will be used in each section (for example, a systematic account of literary genres, a historical



survey of ideas and forms of fiction, concepts of authorship and subjectivity, or of literary meaning and interpretation). More than one national literature or culture represented. One course.

**116. Studies in Film History. (AL)** See C-L: English 185; also C-L: Drama 174 and Film and Video. One course.

**123. Special Topics in Women Writers. (AL)** Issues of gender and representation in works by women from the Middle Ages to the modern period. Concentration on specific periods, areas, or themes. Relationship of women's literature to the other arts, political practices, and social developments. C-L: Women's Studies. One course.

## Management Sciences (MS)

**120. Managerial Effectiveness.** Understanding the nature of management and the factors that influence the effective performance of managers. Topics include the nature of managerial effectiveness; managing groups; leadership strategies; performance motivation and appraisal; conflict management; the manager as decision maker and negotiator. Prerequisite: junior standing. One course.

**161. Marketing Management.** The role of the marketing function in business; product planning, price, promotion, and distribution as elements of a total marketing mix. Formal models in solving the marketing mix problem of the firm. Prerequisite: junior standing. One course.

## Mathematics (MTH)

**19. Precalculus Mathematics. (QR)** For students with CB Achievement Test scores between 460 and 540 or SAT scores between 500 and 600. Selected topics in algebra, trigonometry, and analytic geometry; projects and writing assignments. Designed to increase the mathematical skills and knowledge of students planning to enroll in Mathematics 31. Not open to students who have credit for Mathematics 25L or 26L. One course.

**31L. Laboratory Calculus I. (QR)** Introductory calculus with a laboratory component. Emphasis on laboratory projects, group work, and written reports. Differentiation, transcendental functions, optimization, differential equations, numerical approximations, Euler's method, the Fundamental Theorem, separation of variables, slope fields, and mathematical modeling. Not open to students who have credit for Mathematics 25L or 26L. One course.

**32. Introductory Calculus II. (QR)** Transcendental functions, techniques and applications of integration, indeterminate forms, improper integrals, infinite series. Not open to students who have had Mathematics 32L or 41. Prerequisite: Mathematics 31. One course.

**32L. Laboratory Calculus II. (QR)** Second semester of introductory calculus with a laboratory component. Emphasis on laboratory projects, group work, and written reports. Methods of integration, applications of integrals, functions defined by integration, improper integrals, introduction to probability and distributions, infinite series, Taylor polynomials, series solutions of differential equations, systems of differential equations, Fourier series. Not open to students who have had Mathematics 32 or 41. Prerequisite: Mathematics 26L or 31L or consent of instructor. One course.

**103. Intermediate Calculus. (QR)** Partial differentiation, multiple integrals, and topics in differential and integral vector calculus, including Green's theorem, the divergence theorem, and Stokes's theorem. Prerequisite: Mathematics 32, 32L, or 41. One course.

**104. Linear Algebra and Applications. (QR)** Systems of linear equations and elementary row operations, Euclidean  $n$ -space and subspaces, linear transformations and matrix representations, Gram-Schmidt orthogonalization process, determinants,



eigenvectors and eigenvalues; applications. Prerequisite: Mathematics 32, 32L, or 41. One course.

## Music (MUS)

81. **Strings.** Quarter course.

85. **Voice.** Quarter course.

91. **Strings.** Half course.

## Philosophy (PHL)

41. **Introduction to Philosophy.** (CZ) Examination of problems in philosophy; emphasis on metaphysics and theory of knowledge. One course.

43S. **Introduction to Philosophy.** (CZ) Philosophy 41 conducted as a seminar. One course.

48. **Logic.** (CZ) The conditions of effective thinking and clear communication. Examination of the basic principles of deductive reasoning. One course.

196S, 197S, 198S, 199S. **Seminars in Philosophy.** (CZ) One course each.

## Physics (PHY)

53L, 54L. **General Physics.** (NS) A survey of the principles of physics, intended mainly for students planning study in medicine or the life sciences. The level and coverage are similar to that of Physics 51L, 52L, but there are differences in emphasis. Physics 53L is closed to students having credit for Physics 41L or Physics 51L; Physics 54L is closed to students having credit for Physics 42L or Physics 52L. Prerequisite: Mathematics 31, 32 or 25L, 26L, or equivalent; Mathematics 32 may be taken concurrently with Physics 53L; for 54L: Physics 51L or 53L. One course each.

55. **Introduction to Astronomy.** (NS) The evolving theory of the physical universe. Cosmological models, galaxies, stars, interstellar matter, the solar system, and experimental techniques and results. Several observatory sessions. One course.

## Political Science (PS)

92. **Comparative Politics (B).** (SS) Different types of political systems, their origins and evolution; basis of authority under totalitarian, authoritarian, liberal, and social democratic polities; problems in developing political authority, especially in poor countries via revolution, populism, nationalism, or authoritarianism. C-L: Comparative Area Studies. One course.

93. **Elements of International Relations (D).** (SS) The nature of international politics, the analysis of national power, the instruments of foreign policy, and the controls of state behavior. One course.

175A. **Distributive Justice and the Social Sciences (C-N).** (SS) Prerequisites: Economics 1 or 51 and Economics 2 or 52. See C-L: Economics 199. One course.

## Psychology (PSY)

11. **Introductory Psychology (G).** (SS) Biological bases of behavior, psychological development, cognitive psychology, personality, abnormal behavior, and social psychology. Designed as a broad introduction to psychology for nonmajors as well as majors; not required for the major. Students are expected to participate as subjects in three to six hours of psychological research. One course.

91. **Biological Bases of Behavior: Introduction and Survey (B).** (NS) Physiological, developmental, and evolutionary approaches to behavior. Sensory and cognitive processes, sleep, pain, emotion, hunger, and thirst as well as maternal and sexual behavior patterns. Students required to participate as subjects in three to six hours of

psychological research if not done in a previous introductory class. Prerequisite: Biology 19 or Biology 25L; may be taken concurrently. C-L: Neurosciences. One course.

**97. Developmental Psychology: Introduction and Survey (D).** (SS) Theory and research on growth and behavior from infancy to adolescence. Students required to participate as subjects in three to six hours of psychological research. Not open to students who have taken Psychology 105. One course.

**109A. Health Psychology (P).** (SS) The role of behavior in the etiology, pathophysiology, and treatment of cardiovascular disease and endocrine disorders; psychoneuroimmunology; chronic pain; and life style behaviors with health consequences such as smoking and eating disorders. Not open to students who have taken Psychology 98. One course.

**111. Learning and Adaptive Behavior (B, C).** (NS) Principles of instrumental learning in animals and humans. Prerequisite: none, but some knowledge of quantitative science desirable. One course.

**113A. Self and Society (P).** (SS) See C-L: Cultural Anthropology 141; also C-L: Women's Studies. One course.

**117. Statistical Methods (G).** (QR) See C-L: Sociology 133. One course.

**119A. Abnormal Psychology (P).** (SS) Disordered behavior and constructive personality change viewed in interpersonal and social context for purposes of understanding normal and abnormal personality development and functioning. One course.

**137. Adolescence (D).** (SS) Adolescent development, including identity formation, intelligence, sexuality, peer and parent relationships, vocational choices, drugs, and psychopathology. Theory and empirical findings. One course.

**170S, A-R, U-Z. Selected Problems.** New courses not yet in the bulletin are designated as 170S or 270S depending on their level. Since all faculty offer these courses, their contents vary accordingly. Different courses indicated by the letter. One course.

### **Public Policy Studies (PPS)**

**81. Essentials of Public Speaking.** Basics of and practice in oral presentations, with particular attention to the gathering and organization of speech materials. Preference given to freshmen and sophomores. Does not apply toward public policy studies major. Consent of instructor required. One course.

**82. Essentials of Public Speaking.** Similar to Public Policy Studies 81, but for juniors and seniors. Not open to students who have taken Drama 81 or 82, or Public Policy Studies 81. Does not apply toward public policy studies major. One course.

**165. American International Economic Policy.** (SS) Prerequisites: Economics 1 or 51 and 2 or 52. See C-L: Economics 165. One course.

### **Religion (REL)**

**42. Islam. (CZ)** Introduction to Islam in history and modern times. One course.

**45. Religions of Asia. (CZ)** Problems and methods in the study of religion, followed by a survey of the historical development, beliefs, practices, and contemporary significance of the Islamic religion and religions of south and east Asia. Not open to students who have taken Religion 57. C-L: Comparative Area Studies. One course.

**102. The New Testament. (CZ)** Origins, development, and content of thought. Not open to students who have taken Religion 52. One course.

**148. Alternative Religion in America. (CZ)** Focus on both the historical development of particular traditions (for example, Mormon, Adventist, New Age) and general themes in American religious life (for example, relationship between religion and health, appeal of communitarian and millenarian movements). One course.

**185. Special Topics in Religion.** Topics vary from semester to semester. One course.

### **Sociology (SOC)**

**10D. Introduction to Sociology. (SS)** Structure and dynamics of groups, organizations, and institutions; social behavior over the life cycle; social control and deviance; population and social ecology; formation and change of societies. One course.

**11. Contemporary Social Problems. (SS)** A survey of approaches to the study of current social problems and social trends. Sexism, racism, age discrimination; job displacement by technological change; social consequences of environmental pollution; unemployment and poverty; interpersonal problems associated with changes in family structures; maldistribution of health care and educational opportunities; deviance. One course.

**133. Statistical Methods. (QR)** Elementary statistical techniques and their application to the analysis and interpretation of social science data. Theory of inference is stressed. C-L: Psychology 117. One course.

**153. Sport and Society. (SS)** The effect of sports on people, their self-image, and social roles. Relation of sports as an institution to the family, education, economics, and politics. One course.

**155. Organizations and Management. (SS)** Forms of work organization (corporations, government agencies), the social forces shaping them (management styles, technology, government policy, labor markets), and their effects on employees (productivity, work satisfaction, turnover). C-L: Markets and Management Studies and Women's Studies. One course.

### **Spanish (SP)**

**1-2. Elementary Spanish. (FL)** Understanding, speaking, reading, and writing Spanish. Language laboratory available for recording-listening practice. Two courses.

**63. Intermediate Spanish. (FL)** Grammar review, reading, and oral practice, including laboratory experience. Prerequisite: Spanish 2, 12, or achievement or placement test score of 500-570. One course.

**76. Advanced Intermediate Spanish. (FL)** Oral practice, reading, composition. Prerequisite: Spanish 63 or achievement or placement test score of 580-620. One course.

**101. Advanced Composition and Conversation. (FL)** The refinement of written and oral expression through the analysis of literary texts. Continued development of vocabulary and the study of grammar in context. One course.

### **Statistics (STA)**

**110A. Statistics and Data Analysis in the Social Sciences. (QR)** Descriptive statistics. Probability and its role in statistical inference. Confidence intervals. Tests of significance. Introduction to linear regression modeling. Not open to students who have had Mathematics 136 or Statistics 110B, 112, 113, 114, 210A, 210B, or 213. One course.

### **University Writing Course (UWC)**

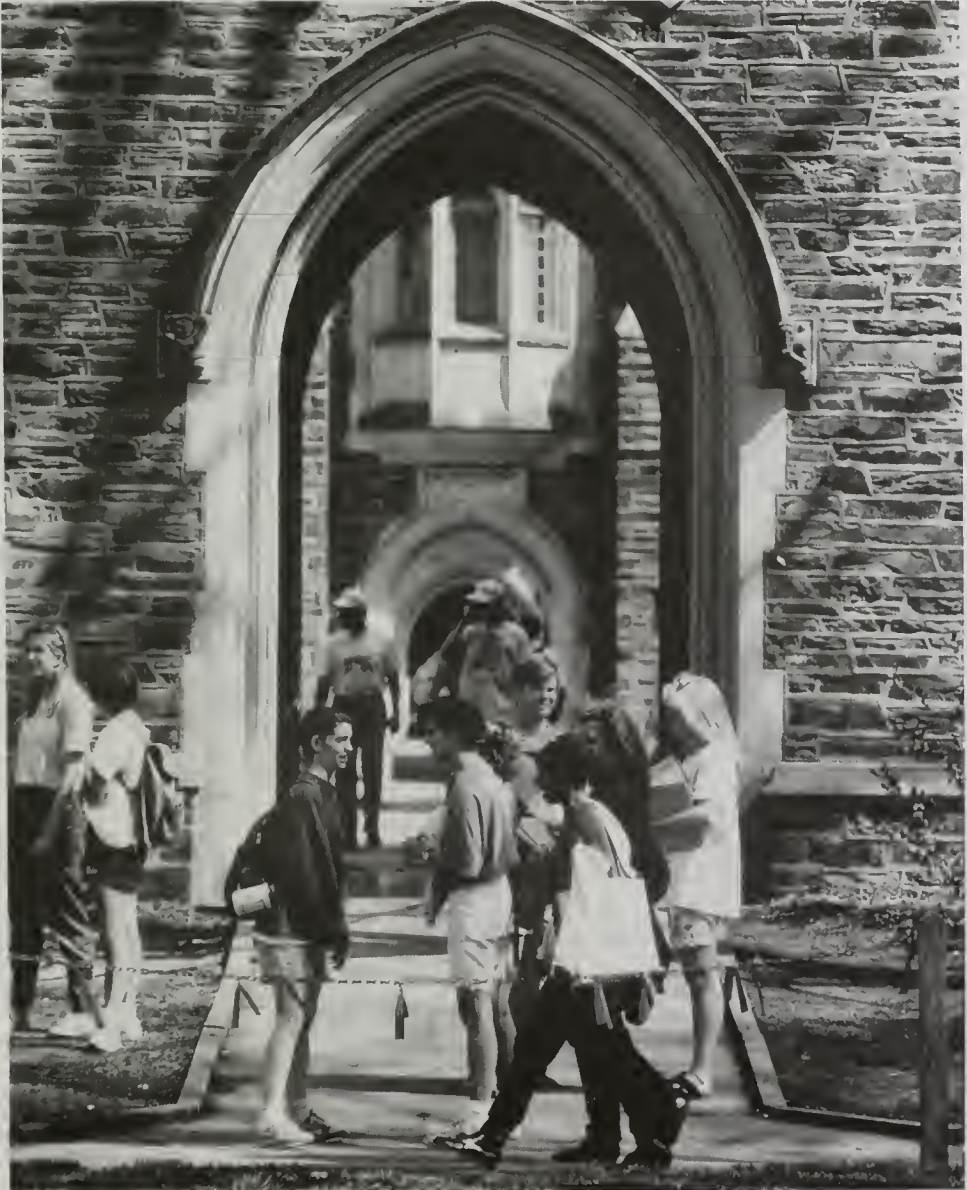
**117S. Advanced Composition I.** Emphasis on the connections between substance and structure; revision techniques and inventional procedures. Tailored to the level, needs, and interests of students who enroll. Prerequisite: previous University Writing Course or consent of the director of the Writing Across the University Program. C-L: English 117A. One course.



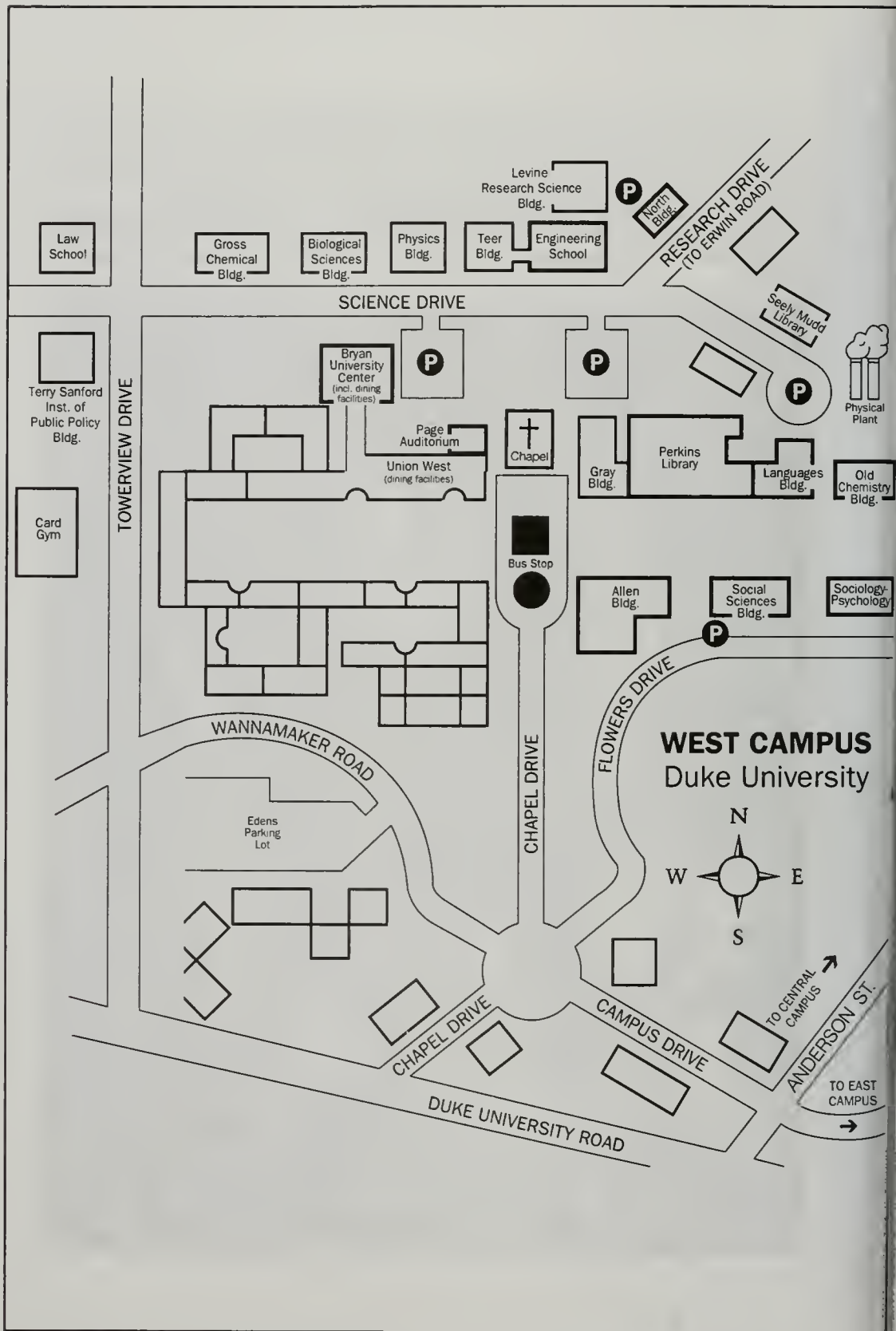
## Women's Studies (WST)

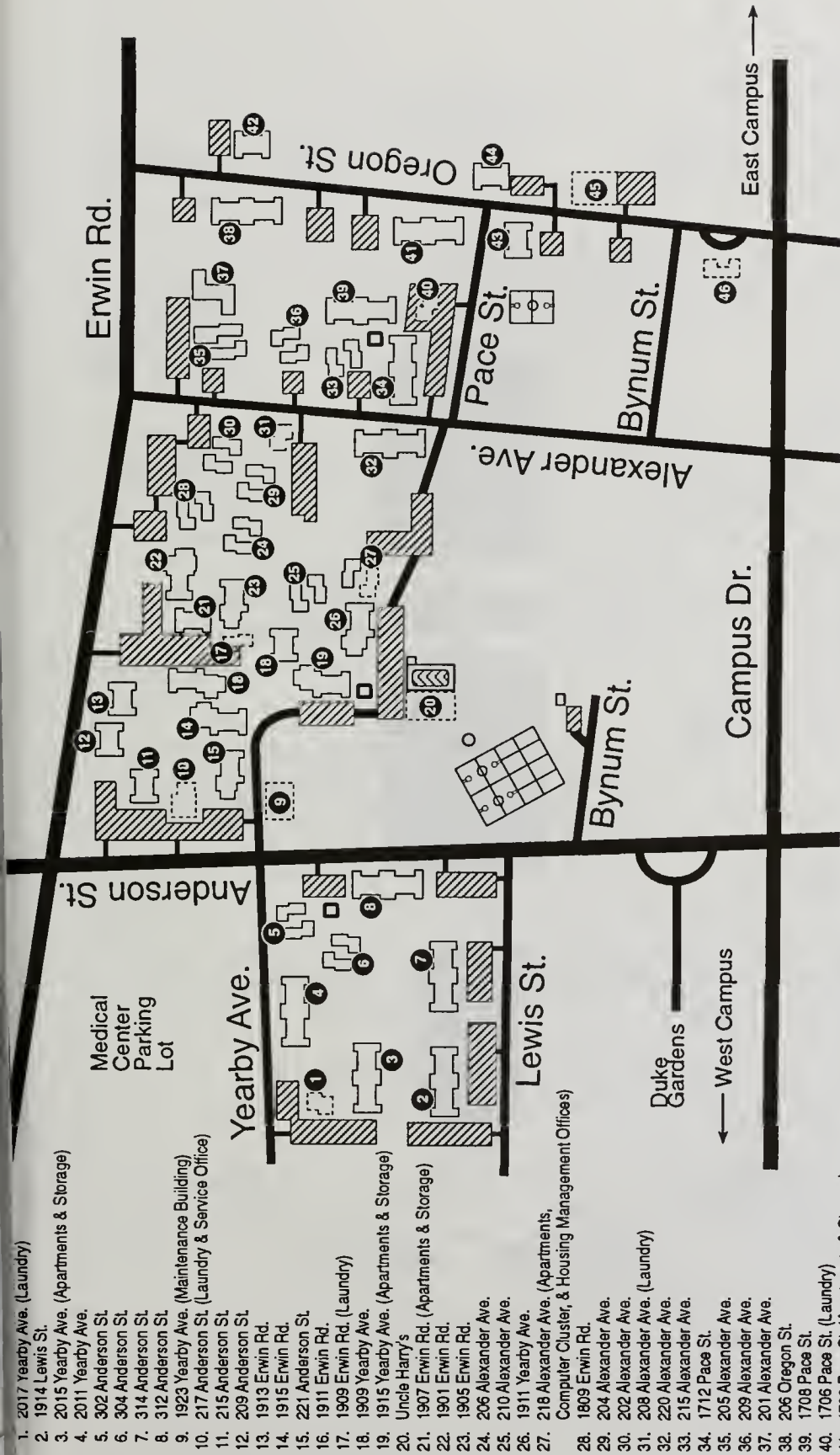
**60. Gender, Social Policy, and Politics. (SS)** A study of the social context of gender roles and the varying political perspectives used to analyze them. Emphasis on contemporary issues and proposed policy solutions to them. One course.

**103. An Introduction to Women's Studies. (SS)** A course about women, gender, and feminist theories in the United States, using a variety of disciplinary approaches to analyze women's experiences, the women's movement, and women's studies. One course.





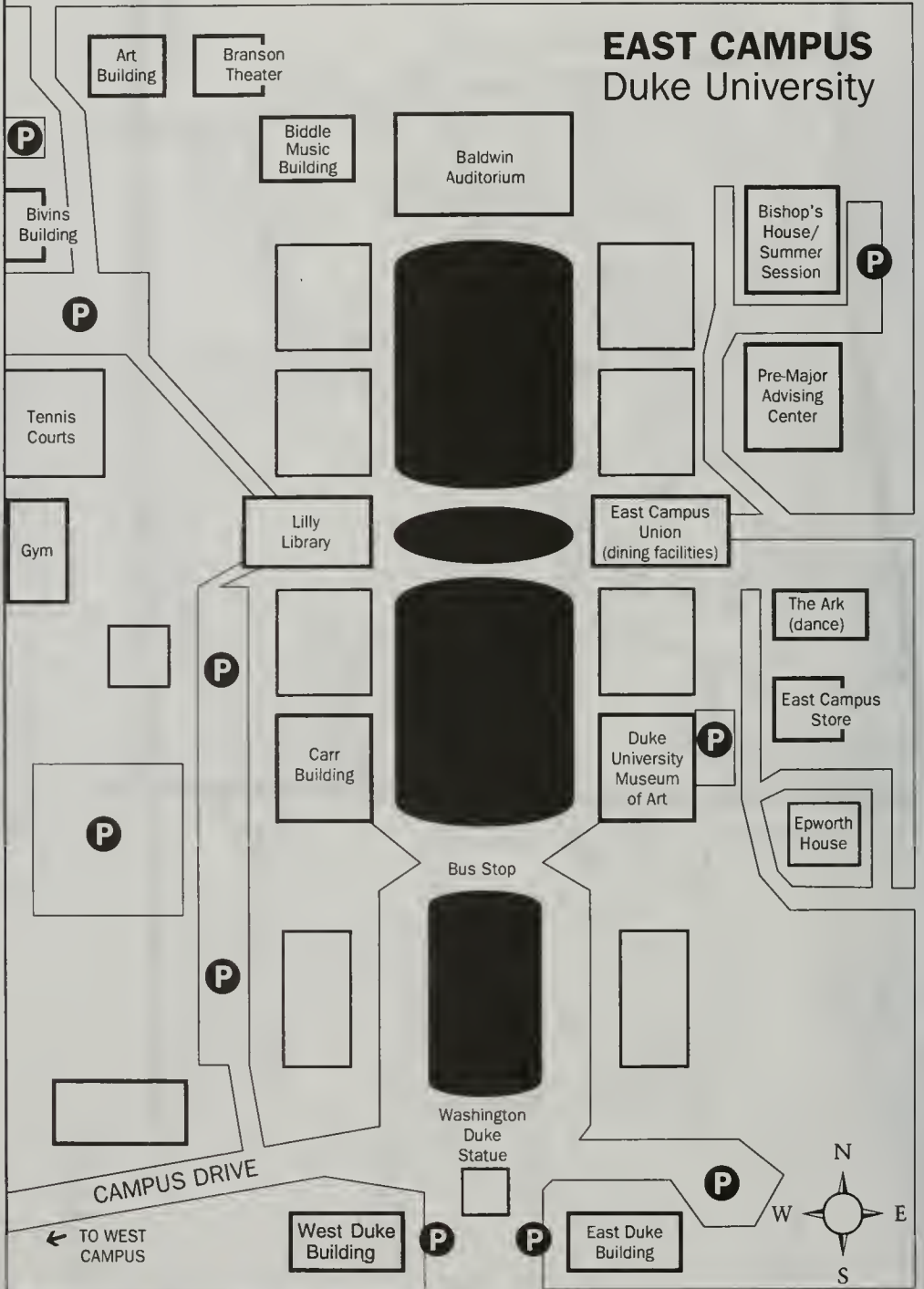




1. 2017 Yearby Ave. (Laundry)
2. 1914 Lewis St.
3. 2015 Yearby Ave. (Apartments & Storage)
4. 2011 Yearby Ave.
5. 302 Anderson St.
6. 304 Anderson St.
7. 314 Anderson St.
8. 312 Anderson St.
9. 1923 Yearby Ave. (Maintenance Building)
10. 217 Anderson St. (Laundry & Service Office)
11. 215 Anderson St.
12. 209 Anderson St.
13. 1913 Erwin Rd.
14. 1915 Erwin Rd.
15. 221 Anderson St.
16. 1911 Erwin Rd.
17. 1909 Erwin Rd. (Laundry)
18. 1909 Yearby Ave.
19. 1915 Yearby Ave. (Apartments & Storage)
20. Uncle Harry's
21. 1907 Erwin Rd. (Apartments & Storage)
22. 1901 Erwin Rd.
23. 1905 Erwin Rd.
24. 206 Alexander Ave.
25. 210 Alexander Ave.
26. 1911 Yearby Ave.
27. 218 Alexander Ave. (Apartments, Computer Cluster, & Housing Management Offices)
28. 1809 Erwin Rd.
29. 204 Alexander Ave.
30. 202 Alexander Ave.
31. 208 Alexander Ave. (Laundry)
32. 220 Alexander Ave.
33. 215 Alexander Ave.
34. 1712 Pace St.
35. 205 Alexander Ave.
36. 209 Alexander Ave.
37. 201 Alexander Ave.
38. 206 Oregon St.
39. 1708 Pace St.
40. 1706 Pace St. (Laundry)
41. 1700 Pace St. (Apartments & Storage)
42. 205 Oregon St.
43. 302 Oregon St.
44. 301 Oregon St.
45. 309 Oregon St. (Restaurant)
46. 502 Oregon St. (Public Safety)

MARKHAM AVENUE

# EAST CAMPUS Duke University



## SCHEDULE CHANGES

Just before the printing of this bulletin a number of course schedule changes were received which are listed below. The information on this page supercedes information contained in the course schedule section on pages 32-44. Please take note of these changes.

### TERM I

1. New meeting time: CS 180.01 Magic and Superstition in the Ancient World, 5-7:05 pm, MTH
2. Course Cancelled: EDU 211.01 Education and the Mass Media
3. Course Added: EDU 209.01 Global Education  
202794 W10.224 M-F 11:00-12:15 20 DiBona, J E
4. Course Added: PS 199C Political Thought in Early American Novels  
202801 W4.307 M-F 11:00-12:15 Holland, M S

### TERM II

1. Course Added: REL 185.01 Ethics and the Internet  
303319 W3.220 MTH 6:00-8:05 15 Robinson, W
2. Course Canceled: EDU 209.01 Global Education

*The most accurate course schedule information is always to be found on the web site maintained by the university registrar which is updated on a daily basis. That address is--*

**<http://registrar.duke.edu/registrar>**

Don't forget that course synopsis information can be accessed at the Summer Session web site--

**<http://learnmore.duke.edu/SummSess>**







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POSTMASTER send change of address to:

Office of the Summer Session  
Box 90059  
The Bishop's House  
Duke University  
Durham, NC 27708

Periodical Class  
Postage  
PAID  
Durham, NC 27708

Term I: May 21-July 2

Term II: July 6-August 15

Summer Semester: May 21-August 15

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*bulletin of*  
**Duke University**  
**1998-99**

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*Undergraduate Instruction*





## **The Mission of Duke University**

The founding Indenture of Duke University directed the members of the university to "develop our resources, increase our wisdom, and promote human happiness."

To these ends, the mission of Duke University is to provide a superior liberal education to undergraduate students, attending not only to their intellectual growth but also to their development as adults committed to high ethical standards and full participation as leaders in their communities; to prepare future members of the learned professions for lives of skilled and ethical service by providing excellent graduate and professional education; to advance the frontiers of knowledge and contribute boldly to the international community of scholarship; to foster health and well-being through medical research and patient care; and to promote a sincere spirit of tolerance, a sense of the obligations and rewards of citizenship, and a commitment to learning, freedom, and truth.

By pursuing these objectives with vision and integrity, Duke University seeks to engage the mind, elevate the spirit, and stimulate the best effort of all who are associated with the university; to contribute in diverse ways to the local community, the state, the nation, and the world; and to attain and maintain a place of real leadership in all that we do.

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*bulletin of*  
**Duke University**  
**1998-99**

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*Undergraduate Instruction*

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The information in this bulletin applies to the academic year 1998-99 and is accurate and current, to the extent possible, as of January 1998. The university reserves the right to change programs of study, academic requirements, teaching staff, the calendar, and other matters described herein without prior notice, in accordance with established procedures.

Duke University does not discriminate on the basis of race, color, national origin, handicap, sexual orientation or preference, gender, or age in the administration of educational policies, admission policies, financial aid, employment, or any other university program or activity. It admits qualified students to all the rights, privileges, programs, and activities generally accorded or made available to students. For further information, contact the equal opportunity officer (919-684-4736).

*The Bulletin of Duke University, Volume 70, includes the following titles: The Fuqua School of Business; Nicholas School of the Environment; Undergraduate Instruction; The Graduate School; The Medical Center; The Divinity School; Information for Prospective Students; Information for Graduate Studies; Summer Session; Graduate Program in Nursing; The School of Law; and Information and Regulations.*

Information that the university is required to make available under the Student Right to Know and Campus Security Acts may be obtained from the Office of University Relations at 684-2823 or in writing to 615 Chapel Drive, Box 90563, Duke University, Durham, North Carolina 27708.

Duke University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia 30033-4097; telephone number 404-679-4501) to award baccalaureates, masters, doctorates, and professional degrees.

Volume 70

March 1998

Number 2

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# Academic Calendar—1998-99

## Summer 1998\*

|        |   |
|--------|---|
| April  |   |
| 1      | Wednesday—Registration begins for Term I and/or Term II       |
| May    |   |
| 21     | Thursday—Term I classes begin                                 |
| 25     | Monday—Memorial Day, classes in session                       |
| 26     | Tuesday—Drop/Add for Term I ends                              |
| June   |   |
| 17     | Wednesday—Last day to withdraw W/P or W/F from Term I courses |
| 29     | Monday—Term I classes end                                     |
| 30     | Tuesday—Reading period  |
| July   |   |
| 1      | Wednesday—Term I final examinations begin                     |
| 2      | Thursday—Term I final examinations end                        |
| 6      | Monday—Term II classes begin                                  |
| 8      | Wednesday—Drop/Add for Term II ends                           |
| 31     | Friday—Last day to withdraw W/P or W/F from Term II courses   |
| August |   |
| 12     | Wednesday—Term II classes end                                 |
| 13     | Thursday—Reading period                                       |
| 14     | Friday—Term II final examinations begin                       |
| 15     | Saturday—Term II final examinations end                       |

## Fall 1998

|           |   |
|-----------|---|
| August    |   |
| 26        | Wednesday—Orientation begins; assemblies for all new undergraduate students |
| 31        | Monday, 8:00 A.M.—Fall semester classes begin                               |
| September |   |
| 7         | Monday—Labor Day, classes in session  |
| 11        | Friday—Drop/Add ends  |
| 25-27     | Friday-Sunday—Homecoming  |
| October   |   |
| 4         | Sunday—Founders' Day  |
| 9         | Friday, 7:00 P.M.—Fall break begins   |
| 14        | Wednesday, 8:00 A.M.—Classes resume   |
| 16        | Friday—Last day for reporting midsemester grades                            |
| 23-25     | Friday-Sunday—Parents' Weekend  |
| 28        | Wednesday—Registration begins for spring semester, 1999                     |
| November  |   |
| 17        | Tuesday—Registration ends for spring semester, 1999                         |
| 18        | Wednesday—Drop/Add begins   |
| 25        | Wednesday, 12:40 P.M.—Thanksgiving recess begins                            |
| 30        | Monday, 8:00 A.M.—Classes resume  |
| December  |   |
| 10        | Thursday, 7:00 P.M.—Fall semester classes end                               |
| 11-13     | Friday-Sunday—Reading period  |
| 14        | Monday, 9:00 A.M.—Final examinations begin                                  |
| 19        | Saturday, 10:00 P.M.—Final examinations end                                 |

\*The Nicholas School of the Environment, the Fuqua School of Business, the Marine Laboratory, the Graduate Nursing Program, and Physical Therapy may have different starting dates during the summer; consult the appropriate bulletins and schedules.

## Spring 1999

### January

- 13 Wednesday—Registration and matriculation of new undergraduate students
- 14 Thursday, 8:00 A.M.—Spring semester classes begin
- 27 Wednesday—Drop/Add ends

### February

- 26 Friday—Last day for reporting midsemester grades

### March

- 12 Friday, 7:00 P.M.—Spring recess begins
- 22 Monday, 8:00 A.M.—Classes resume
- 31 Wednesday—Registration begins for fall semester, 1999, and summer 1999

### April

- 15 Thursday—Registration ends for fall semester, 1999; summer registration continues
- 16 Friday—Drop/Add begins
- 28 Wednesday, 7:00 P.M.—Spring semester classes end
- 29-30 Thursday-Friday—Reading period begins

### May

- 1-2 Saturday-Sunday—Reading period continues
- 3 Monday, 9:00 A.M.—Final examinations begin
- 8 Saturday, 10:00 P.M.—Final examinations end
- 14 Friday—Commencement begins
- 16 Sunday—Graduation exercises. Conferring of degrees





# University Administration

## GENERAL ADMINISTRATION

Nannerl Overholser Keohane, Ph.D., *President*  
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William H. Willimon, M.Div., S.T.D., *Dean of the Chapel*

## GENERAL ACADEMIC ADMINISTRATION

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James S. Roberts, Ph.D., *Vice-Provost for Budgets and Planning*  
Lewis M. Siegel, Ph.D., *Vice-Provost for Interdisciplinary Activities and Dean of the Graduate School*  
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Stanley Fish, Ph.D., *Associate Vice-Provost and Executive Director of Duke University Press*  
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## Arts and Sciences

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Robert F. Barkhau, B.S., *Director of Facilities for Arts and Sciences*  
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Thomas D. Mann, A.B., *Associate Dean for Administration*  
Melissa J. Mills, M.B.A., *Assistant Dean for Computing*  
Susan C. Ross, A.B., *Associate Dean for Advancement*  
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Lee W. Willard, Ph.D., *Associate Dean for Academic Planning and Special Projects*

## Trinity College

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Paula Gilbert, Ph.D., *Assistant Dean for Summer Session and Continuing Education*  
Caroline L. Lattimore, Ph.D., *Assistant Dean for Social Sciences*  
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Norman C. Keul, Ph.D., *Assistant Dean for Pre-Majors and Director of the Pre-Major Advising Center*  
Kay H. Singer, Ph.D., *Assistant Dean for Natural Sciences, Director of Health Professions Advising Center*

## **The School of Engineering**

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Marion L. Shepard, Ph.D., *Associate Dean for Undergraduate Affairs*

Constance E. Simmons, M.B.A., *Assistant Dean for Undergraduate Affairs*

## **Student Affairs**

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R. James Clack, Ph.D., *Director, Counseling and Psychological Services*

William A. Christmas, M.D., F.A.C.P., *Director of Student Health*

Susan L. Coon, M.A., *Dean of University Life*

Caroline Nisbet, M.A., *Director of Resource Administration*

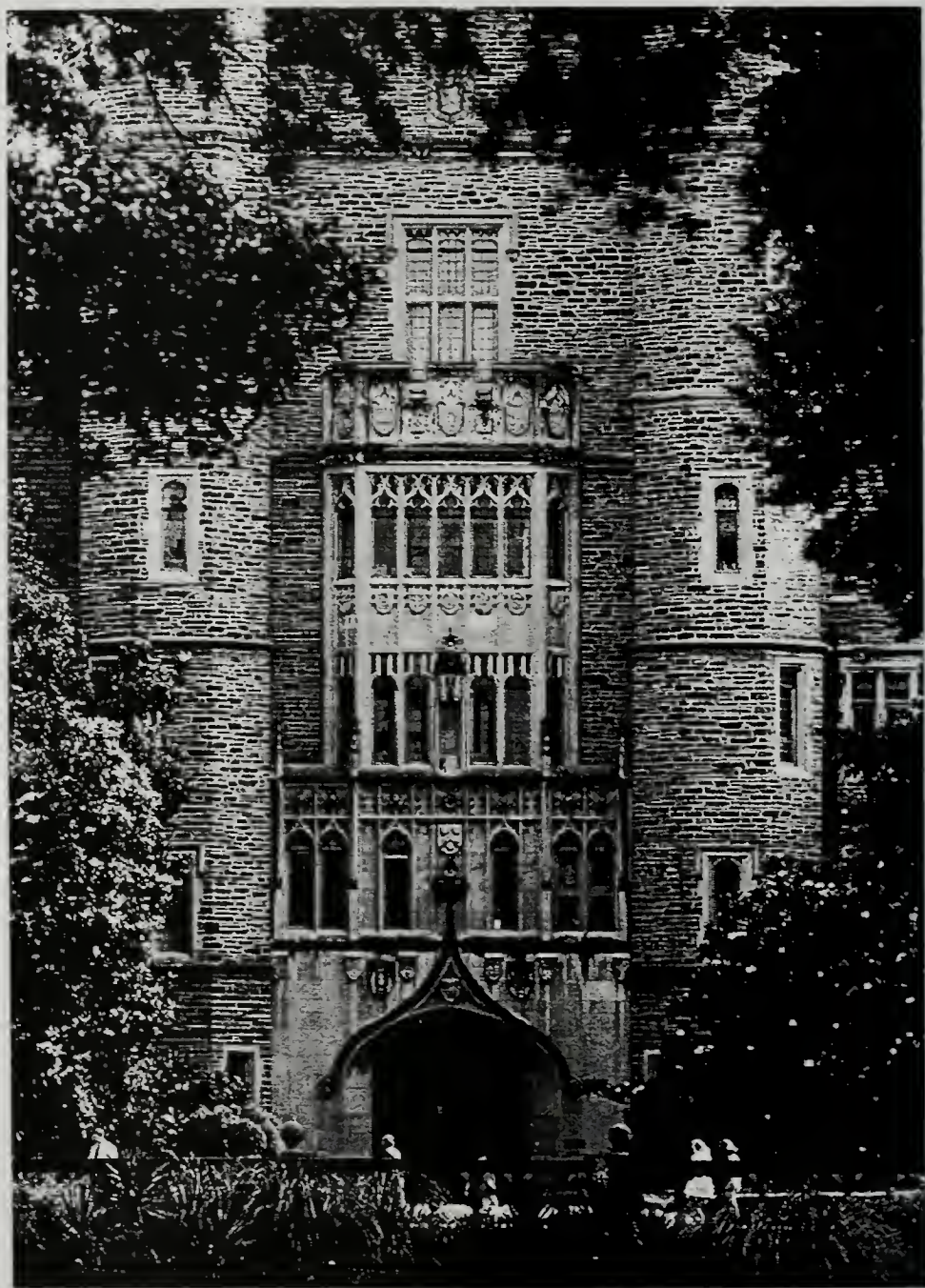
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## **Admissions and Financial Aid**

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## *General Information*



## Duke University

In 1839 a group of citizens from Randolph and adjacent counties in North Carolina assembled in a log schoolhouse to organize support for a local academy founded a few months earlier by Brindle York. Prompted, they said, by "no small share of philanthropy and patriotism," they espoused their belief that "ignorance and error are the banes not only of religious but also civil society which rear up an almost impregnable wall between man and happiness." The Union Institute, which they then founded, was reorganized in 1851 as Normal College to train teachers, and again in 1859 as Trinity College, a liberal arts college, which later moved from the fields of Randolph County to the growing city of Durham, North Carolina. Trinity College was selected by James B. Duke as the major recipient of a fortune when, in 1924, he provided endowment funds for the university that would be organized around Trinity College and named for the Duke family.

The old Trinity College had, like almost all institutions in America at the time it was founded, been restricted to men. In 1896, Washington Duke gave an endowment with the condition that women be admitted "on equal footing with men." Thereafter, women were educated in Trinity College, and in 1930 the Woman's College was established as a separate college. Trinity College and the Woman's College continued as coordinate colleges for over forty years. To assure that women were indeed admitted "on equal footing with men," and to recognize that the education which men and women had received at Duke had long taken place in the same classrooms, the university merged these coordinate colleges in 1972 to form Trinity College of Arts and Sciences, the liberal arts undergraduate college of the university. The Bachelor of Arts and Bachelor of Science degrees may be earned in the college.

Instruction in engineering started at Normal College in 1851 and was continued at Trinity College as an option in the arts and sciences program. A Department of Engineering was established at Trinity in 1910. Following the establishment of Duke University in 1924, the Departments of Civil and Electrical Engineering were formed in 1927, and a Department of Mechanical Engineering was added four years later. The three engineering departments were joined to form the Division of Engineering as a separate administrative unit of the university. In 1939 this division was renamed the



College of Engineering, which in 1966 became a professional school of engineering. The Division of Biomedical Engineering was added to the School of Engineering in 1967, and it was recognized as a department in 1971. In 1974, the name of the mechanical engineering department was changed to the Department of Mechanical Engineering and Materials Science; in 1982, the Department of Civil Engineering was renamed the Department of Civil and Environmental Engineering; in 1995, the Department of Electrical Engineering was renamed the Department of Electrical and Computer Engineering. All four departments offer courses leading to Bachelor of Science in Engineering, Master of Science, and Doctor of Philosophy degrees.

The School of Nursing was established in 1931 in association with the School of Medicine and Duke Hospital. From 1944 until 1984, the Bachelor of Science in Nursing Education degree was offered. In 1980, the University Board of Trustees approved the phaseout of the existing undergraduate degree programs. At present, the School of Nursing offers courses leading to the Master of Science in Nursing degree, a program initiated in 1958.

As the university developed around the core of undergraduate colleges and schools, the Graduate School, organized in the 1920s, expanded in areas of instruction and research. It now consists of some fifty-five departments and programs and offers A.M., M.S., M.A.T., M.P.P., and Ph.D. degrees. In 1930, the School of Law of Trinity College was established as a graduate professional school, the Duke University School of Law, and was followed by other professional schools. The Divinity School was organized in 1926 and the School of Medicine in 1930. The School of Forestry which began in 1938 grew into the School of Forestry and Environmental Studies in 1974, was restructured to become the School of the Environment in 1991, and named the Nicholas School of the Environment in 1995. The Graduate School of Business Administration was established in 1969 and renamed the Fuqua School of Business in 1980.

Duke, a privately supported, church-related (Methodist) university, has over 10,000 students enrolled in degree programs. These students represent nearly every state and many foreign countries; Duke has more than 85,000 alumni in all fifty states and in numerous foreign countries. The university is a member of the North Carolina Association of Independent Colleges and Universities, the Southern Association of Colleges and Schools, and the Association of American Universities.

From academy to university, some of the basic principles have remained constant. The Duke University motto, *Eruditio et Religio*, reflects a fundamental faith in the union of knowledge and religion, the advancement of learning, the defense of scholarship, the love of freedom and truth, a spirit of tolerance, and a rendering of the greatest service to the individual, the state, the nation, and the church. Through changing generations of students, the objective has been to encourage individuals to achieve, to the extent of their capacities, an understanding and appreciation of the world in which they live, their relationship to it, their opportunities, and their responsibilities.

## Resources of the University

**The Faculty.** The university faculty, numbering approximately 1,900, maintains a tradition of personal attention to students and devotion to research. Many members of the faculty have been cited for excellence in teaching and are elected to membership in the national societies which honor those best in scholarship and research. Leaders in their disciplines and their professional organizations, they are authors of significant books and articles. Members of the faculty also act as consultants to industry, government, and foundations. To honor its outstanding faculty, the university has established more than one hundred James B. Duke and other named professorships.

**The Library System.** The libraries of the university consist of the William R. Perkins Library and its seven branches on campus: Biology and Environmental Sciences, Chemistry, Lilly, Engineering, Music, Mathematics-Physics, Special Collections; the Pearce Memorial Library at the Duke Marine Laboratory in Beaufort; and the independently administered libraries of Divinity, Law, Medicine, and Business (Fuqua). As of June 1996, these libraries contained over 4.5 million volumes. The collection includes 10.9 million manuscripts, and over 2,000,000 public documents. An array of resources and services is available electronically from the university's libraries. For access, visit the Duke University libraries web site at <http://www.lib.duke.edu>.

*The William R. Perkins Library.* The William R. Perkins Library, the main library of the university, houses books, journals, and electronic resources supporting the humanities and the social sciences, as well as a large collection of United States federal and state documents and public documents of many European and Latin American countries. The library is a depository for U.S., North Carolina, and European Community documents. An international focus is evident throughout the library collections, reflecting the global and interdisciplinary directions of scholarship and teaching as well as the historical strengths of area programs at the university. Included are extensive research collections from and about South Asia, Latin America, Africa, Europe, Russia, and Poland, as well as the country's largest collection of Canadiana. The East Asian Collection offers resources in Japanese, Chinese, and Korean on a variety of topics, predominantly history, politics, literature, and language. The newspaper collection includes many eighteenth-century titles; strong holdings of nineteenth-century New England papers; and antebellum and Civil War papers from North Carolina, South Carolina, Virginia, and Georgia; as well as many European and Latin American papers.

The Special Collections Library holdings range from ancient papyri to records of modern advertising. They number more than 200,000 printed volumes and more than 10.9 million items in manuscript and archival collections. They support research in a wide variety of disciplines and programs, including African-American studies, anthropology, classics, economics, history, literature, political science, religion, sociology, and women's studies. Areas of particular strength in the collections include the history and culture of the American South, English and American literature, history of economic theory, British and American Methodism, and the history of modern advertising.

The Circulation/Reserves Department administers course reserves, including the campus-wide electronic reserves system. The Lilly Library houses the university's principal collections of the visual arts and art history, drama, and philosophy. The Lilly Library is also the location of the Paul B. Williams Multimedia Broadcast Center. This state-of-the-art facility features remote transmission facilities for the campus as well as the film and videocassette collection. The branch libraries serve the academic disciplines bearing their names, as well as provide access to electronic resources available through the online catalog.

The Music Library, located in Room 113 of the Mary Duke Biddle Music Building, and the Music Media Center, located in Room 027 of the same building, are administered as a single branch library within the Perkins Library system. The Music Library contains a rapidly expanding collection of over 100,000 books on music and music scores, as well as over 200 journals in the field. The Music Media Center has a collection of over 20,000 media items, including compact discs, cassettes, LP recordings, laser discs, and videotapes, plus a collection of over 10,000 microforms, along with various facilities for listening and viewing.

The libraries at Duke, North Carolina Central University, the University of North Carolina at Chapel Hill, and North Carolina State University are connected by a computer network. Members of the Duke community can easily and quickly determine what books and other library materials are held by UNC, NCCU, and NCSU. Through a reciprocal borrowing agreement, faculty and students at Duke may borrow materials from all of these libraries.

Reference librarians are on duty in Perkins Library for most of the hours the library is open. Their primary responsibility is to assist patrons in making the most effective use of information resources, including library collections and facilities. In addition to answering specific questions, the reference librarians also help patrons access information by identifying and explaining the use of library sources and by giving formal and informal instruction to groups of students, faculty, or staff. Professional reference service is also available to students in all other campus libraries.

Tours of the Perkins Library are given frequently during Orientation Week and upon request throughout the year. Information about other campus libraries may be obtained from the staff in each of the libraries. Handbooks about library services and facilities are also available in each of the libraries.

*The Medical Center Library.* The Medical Center Library, located in the Seeley G. Mudd Building, provides the services and collections necessary to further educational, research, and clinical activities in the medical field. Services are available to Medical Center faculty, staff, and students from the School of Medicine, School of Nursing, Division of Allied Health, and Duke Hospital, as well as graduate departments in the basic medical sciences.

Over 282,468 volumes are available, including the Trent Collection in the History of Medicine. Approximately 2,470 journal subscriptions are currently received, and the library has extensive back files of older volumes. The collection contains over 1,073 multimedia and audiovisual items. The Medical Library Education Center (MLEC), located on the lower level of the library, houses an electronic classroom for hands-on computer training, as well as an area for using multimedia programs. The Frank Engel Memorial Collection consists of a small group of books on consumer health and nonmedical subjects for general reading, together with several newspapers and popular magazines.

Traditional library services include reference, circulation, Internet assistance, and document delivery services, which are supplemented by mediated and self-service online database searching. Public workstations for searching databases and the online card catalog are available in the reference area and other areas of the library. Detailed information on services and resources may be found in the information guides available at the library.

*The School of Law Library.* The School of Law Library, with over 500,000 volumes, serves both the university and the local legal community. It features comprehensive coverage of basic Anglo-American primary source materials, including nearly all reported decisions of federal and state courts, as well as current and retrospective collections of federal and state codes and session laws. Digests, legal encyclopedias, and other indexing devices provide access to the primary documents. A large section of the library collection is devoted to treatises on all phases of law, as well as history, economics, government, and other social and behavioral sciences relevant to legal research. The treatises are organized in the Library of Congress classification system and most are accessible through the Duke University online catalog. Special treatise collections are maintained in several subject areas, including the George C. Christie collection in jurisprudence and the Floyd S. Riddick collection of autographed senatorial material. The library is a selective depository for United States government



publications, with concentration on congressional and administrative law materials. The library receives the records and briefs from the United States Supreme Court and the North Carolina Supreme Court and Court of Appeals. In addition to its U.S. holdings, the library holds substantial research collections in foreign and international law. The foreign law collection is extensive, with concentrations in Australia, Canada, France, Germany, Great Britain, India, and South Africa. The international law collection is strong in primary source and treatise material on both private and public international law topics. Undergraduate and graduate students whose course of study requires access to legal literature may use the library. However, access to the library may be restricted during certain times.

**University Archives.** The Duke University Archives, the official archival agency of the university, collects, preserves, and administers the records of the university having continuing administrative or historical value. The institutional archives, which also include published material, photographs, records of student groups and faculty, and selected memorabilia, are available for research under controlled conditions in 341 Perkins Library.

**The Office of Information Technology (OIT).** OIT is the home of information technology for the university community; it is responsible for computing, telephony, and tele-video services and support. OIT's web site, at <http://www.oit.duke.edu>, offers information, instructions, software downloads, and more.

**Computing.** OIT provides students with a range of computer support services including Internet access. All undergraduate residence halls and Central Campus apartments are wired for direct access to DukeNet, the campus-wide computer network. During the first weeks of school, OIT helps students establish their "dorm net" connections: with a computer and an ethernet adapter, students get high-speed access to e-mail, the World-Wide Web, and all the rest the Internet has to offer.

Located throughout campus, OIT's public computer clusters offer up-to-date UNIX, Windows, and Macintosh computers for student use. All offer laser printers and DukeNet access. OIT's Help Desk staff is available to assist students with Duke-supported software, hardware, and services. The Help Desk web site is at <http://www.oit.duke.edu/helpdesk>; you can send electronic mail to [helpdesk@duke.edu](mailto:helpdesk@duke.edu); or you can call 684-2200.

**Telephones.** Telephone service is available for a nominal installation fee and a monthly charge. Voice Mail service is also available. For more information inquire at the Residential Services office at 919-684-2538, Monday through Friday, 8 am to 5 pm. You can visit the office in Room 100, Tel-Com Building or the web at <http://www.oit.duke.edu/oit/phone.html>.

**Cable Television.** DTV, Duke Television, provides state-of-the-art cable TV service. Service options include: EdNet, which has 12 educational channels; DevilVision, which offers 27 entertainment channels; and other premium channel options and combinations. Students sign up by visiting the customer service center in Room 100 of the Tel-Com Building. For more information, see <http://dtv.oit.duke.edu/> or call 919-613-4388.

**Science Laboratories.** In addition to the teaching and research laboratories in the departments of natural and social sciences and in the School of Engineering, there are other facilities in which some advanced undergraduates work on individual projects. These include the Duke University Marine Laboratory in Beaufort, North Carolina; the Phytotron of the Southeastern Plant Environment Laboratories, located on the Duke campus; the Duke Forest, adjacent to the campus; the Duke University Primate Center in Duke Forest; the Triangle Universities Nuclear Laboratory; and the Free Electron



Laser Laboratory, also on campus. The Levine Science Research Center, which opened recently, houses 341,000 gross square feet consisting of laboratories, office and classroom space for interdisciplinary science research, state-of-the-art teaching laboratories, and shared instrumentation facilities. In particular, undergraduates will have the opportunity to use the expanded laboratory space in the center for research for their own academic work or as assistants to others.

## Duke as a Residential University

Duke enjoys a long tradition as a residential university and has sought to provide for undergraduates attractive on-campus housing in both residence halls and apartments. While the university was established to provide a formal educational opportunity for students, Duke has always taken the position that education encompasses social and personal development as well as spiritual and intellectual growth. Duke seeks to provide a supportive environment substantially anchored in its residential program.

Educational, cultural, recreational, and outdoor adventure programming is planned and presented throughout the year for living groups through the cooperative work of Student Affairs, Trinity College of Arts and Sciences, the School of Engineering, and resident students. There are a number of faculty members who live in residence halls. Seminar rooms are also located in several houses. The goals of these various programs are to enhance the quality of intellectual and social life for the residents on campus, to facilitate student-faculty interaction outside of the formal classroom setting, and to develop a greater sense of community within the individual residence halls as well as within the greater university.

## The Undergraduate College and School

In Trinity College of Arts and Sciences and the School of Engineering, instruction is offered by university faculty who engage in research and in graduate and undergraduate teaching. Duke offers its undergraduates the opportunity to study with many internationally recognized experts in their disciplines and with faculty members who are jointly committed to undergraduate instruction and to the advancement of knowledge. The university recognizes that students learn not only through formal lectures, but also through the interplay of ideas among faculty members and students; thus, it offers undergraduates opportunities to test their ideas against those of their professors and to observe at close range those who have committed their lives to academic careers.

The university, if it is doing its job properly, is educating citizens of the United States and of the world, not only individuals aspiring to personal fulfillment. At Duke, the men and women who earn degrees are likely to become leaders in industry, government, and the professions. They will have influence on and will be influenced by the social fabric of which they are a part. The kind of people they become will matter not only to them and their families, but also to their communities, to the United States, and to the countries of the rest of the world as well.

Amidst changing external conditions, the university must ensure that students acquire the tools and flexibility to prepare them for life-long learning activities.

**Trinity College of Arts and Sciences.** In Trinity College, the liberal arts are a means through which students explore the world of ideas from art and music to neurosciences and physics. The undergraduate program, rated one of the finest in the country, helps students learn how to deal successfully with the challenges, intellectual and

philosophical, that modern life provides. Trinity College is a community of outstanding students and talented, nationally ranked faculty. As members of this community, students learn to ask questions, analyze rationally, challenge ideas, and contribute to the continuing development of knowledge.

The Trinity experience offers a traditional liberal arts base of study and currently offers, within broad limits, exposure to great ideas in six major areas: arts and literatures, civilizations, foreign languages, quantitative reasoning, natural sciences, and social sciences. It offers exposure across a broad spectrum as well, and interdisciplinary and interdepartmental programs stretch horizons even further. Internships and apprenticeships in areas related to students' majors are increasingly available so that practical experience can complement a more formal education. In a world where people are drawn ever closer together, the understanding of cultural difference and diversity becomes increasingly important. Our study abroad programs are varied and plentiful.

The undergraduate college of arts and sciences is unique in that it is set within a distinguished research university. We believe that this combination provides unparalleled opportunities for interaction with faculty, both inside and outside the classroom. The arts and sciences faculty boasts some of the most highly rated scholar-teachers in the country. They challenge students both to master and to reach beyond the basics of fundamental knowledge. At Duke there is a genuine concern for learning, and students are prepared by academic challenges and their individual experiences for the critical decision-making required of them for participatory citizenship, full personal lives, and successful careers.

**School of Engineering.** The undergraduate engineering program at Duke University is designed both for students who intend to become professional engineers and for those who desire a modern, general education based on the problems and the promises of a technological society. The environment in which students are educated is as important in shaping their future as their classroom experiences. In the Duke School of Engineering this environment has two major components: one is modern technology derived from the research and design activities of faculty and students in the school; the other is the liberal arts environment of the total university, with its humanitarian, social, and scientific emphases.

Engineering is not a homogeneous discipline; it requires many special talents. Some faculty members in the School of Engineering are designers; they are goal-oriented, concerned with teaching students how to solve problems, how to synthesize relevant information and ideas and apply them in a creative, feasible design. Other engineering faculty members function more typically as scientists; they are method-oriented, using the techniques of their discipline in their teaching and research to investigate various natural and artificial phenomena.

## *Degree Programs*



## Degrees and Academic Credit

Duke University offers in Trinity College of Arts and Sciences the degrees of Bachelor of Arts and Bachelor of Science, and in the School of Engineering the degree of Bachelor of Science in Engineering. Within the curriculum of each college or school, students have the major responsibility for designing and maintaining a course program appropriate to their background and goals. They are assisted by faculty advisors, departmental directors of undergraduate studies, and academic deans.

Credit toward a degree is earned in units called semester courses (s.c.), commonly abbreviated as courses. These courses ordinarily consist of three to four hours of instruction each week of the fall or spring semester or the equivalent total number of hours in a summer term. Double courses, half courses, and quarter courses are also recognized.

## Trinity College of Arts and Sciences

A variety of approaches to a liberal education is provided by Program I and II. Either program leads to the Bachelor of Arts or Bachelor of Science degree, and each requires thirty-four semester courses.

### PROGRAM I

Program I provides for the experience and achievement that constitute a liberal education. The ability to organize ideas and to communicate them with clarity and precision is refined by completing the writing course and by the requirement for discussion in small groups. Knowledge of a foreign language contributes to an understanding of the nature of language itself and to perspectives on other cultures. Through courses in arts and literatures students learn about the creative products of the human intellect; courses about civilizations ask students to attend to the analysis and evaluation of ideas and events that shape civilizations past and present. Through courses in natural sciences students learn how to interpret and utilize information in an increasingly technological world, while courses in quantitative reasoning help develop skills of inference and analysis. Finally, through courses in the social sciences students learn about the causes of human behavior and about the origins and functions of the social structures in which we operate.

Students must complete the requirements listed below and explained, where necessary, on the following pages. No degree requirements, except the requirement for thirty-four course credits and continuation requirements, may be met by a course passed under a pass/fail option unless the course is offered only on that basis.

Students must accept personal responsibility for understanding and meeting the requirements of the curriculum.



**Writing.** Students are required to demonstrate ability to write effective English prose by completing a course in expository writing, ordinarily University Writing Course 4, 5, 6, 7, or 8. See the section University Writing Program in the chapter "Courses and Academic Programs."

General Studies consisting of courses in at least five of the following six areas of knowledge:

- Arts and Literatures (AL)
- Civilizations (CZ)
- Foreign Languages (FL)
- Natural Sciences (NS)
- Quantitative Reasoning (QR)
- Social Sciences (SS).

—In four of these areas a student must take three courses; at least one of the three in each area must be at the 100-level.

—In the remaining area a student must take two courses.

—Independent study courses do not count toward these areas.

—Advanced placement credits do not substitute for courses in these areas.

—Courses counting toward requirements in a major (and additional courses taken in the major department) do not count toward more than two of these areas.

**The Major** consists of the requirements for majors in the department or program in which a student wishes to obtain a bachelor's degree (see below). These requirements are described under the course listing for each department or program.

**The Minor.** Minors are available although not required. They are described under the course listing for each department or program.

**Elective courses.** Advanced placement credits may function as elective courses. Other courses that a student is using as electives may or may not carry an area of knowledge designation.

**Small Group Learning Experiences.**

—During the first year: one of the following: (1) a first-year seminar (49S), (2) a 20-series seminar, (3) a FOCUS program seminar, or (4) any other full course designated as a seminar.

—During the junior and senior years: at least two full courses designated as seminars, tutorials, independent study, or a thesis.

**Course credits.** There are several separate and specific requirements concerning course credits in Trinity College. Thirty-four (34) courses are required for graduation, not more than two with a grade of *D*, and including:

—At least twelve (12) courses at or above the 100-level.

—No more than: one credit of physical education activity (i.e., two half-credit activity courses), four credits of dance/American Dance Festival technique/performance (i.e., eight half-credit courses), two credits for house courses (i.e., four half-credit house courses), six from a professional school (e.g., business, engineering, medicine, environment (courses numbered 200 or above), four in military science, and one credit from academic internships.

—The number of advanced placement and transfer credits allowed. (See the sections "Advanced Placement" and "Transfer of Work Elsewhere" in the chapter "Academic Procedures and Information.")

**General Studies (Distribution of Courses).** Students achieve breadth and balance of intellectual experience by taking courses in at least five of the six areas of knowledge.

Courses that can be taken to satisfy the distribution requirement are identified in the bulletin by a two-letter code (AL, CZ, FL, NS, QR, SS). In four of the areas of knowledge a student must take at least three courses. At least one of the three courses must be at the 100 or 200 level. In one additional area of knowledge a student is required to take at least two courses. Courses counting toward requirements in a major (and additional courses taken in the major department) do not count toward more than two of these areas.

**The Major.** Students are expected to acquire some mastery of a particular discipline or interdisciplinary area as well as to achieve a breadth of intellectual experience. They therefore complete a departmental major, a program major, or an interdepartmental major. All majors require a minimum of ten courses, at least eight of which must be at the 100 level or above. The total number of courses that a department/program may require at any level in the major and related departments may not exceed seventeen semester courses for the Bachelor of Arts degree and nineteen semester courses for the Bachelor of Science degree. At least half the courses for a student's major field must be taken at Duke although individual departments and programs offering majors may require that a greater proportion be taken at Duke. Students are responsible for meeting the requirements of a major as stated in the bulletin for the year in which they matriculated in Trinity College although they have the option of meeting requirements in the major changed subsequent to their matriculation. A student who declares and completes requirements for two majors may have both recorded on the official record. See the chapter "Academic Procedures and Information" for the majors within each degree and for procedures on declaring a major.

*Departmental Major.* The courses for a departmental major may include introductory or basic prerequisite courses and higher-level courses in the major department or in the major department and related departments. Departmental majors are available in art history, biological anthropology and anatomy, chemistry, classical languages, classical studies, computer science, cultural anthropology, economics, English, French studies, geology, Germanic languages and literature, history, Italian and European studies, mathematics, music, philosophy, physics, political science, psychology, public policy studies, religion, Slavic languages and literatures, sociology, Spanish, and visual arts. The courses required for a major are specified by the department. The requirements appear in the section following each department's course descriptions.

*Program Major.* Students may satisfy the requirement by completing work prescribed for a major in approved programs, often interdisciplinary. These programs include African and African-American studies, Asian and African languages and literature, biology, Canadian studies, comparative area studies, drama, environmental sciences and policy, linguistics, literature, medieval and Renaissance studies, and women's studies. The requirements for these majors appear under each program in the chapter "Courses and Academic Programs."

*Interdepartmental Major.* A student may pursue an interdepartmental major program designed by the student and advisors, and approved by the director of undergraduate studies in the advisor's department, as an alternate means of satisfying the major requirement. An interdepartmental major consists of ten courses, at least four of which must be at the 100 level or above in each of two or more Trinity College departments or programs that offer a major. For procedures see the section on declaration of major or division in the chapter "Academic Procedures and Information."

**The Minor.** The courses required for a minor are specified by the department/academic program. Minors require a minimum of five courses, including at least three at the level of 100 or above. Further information about specific minors is available under the description of the individual department/academic programs in the chapter

"Courses and Academic Programs." Students may not major and minor in the same department/program with the exception of three departments, in which multiple majors are already possible: (1) Art and Art History, (2) Classical Studies, and (3) Romance Studies. At least half the courses taken to satisfy a minor must be taken at Duke although individual departments may require that a greater proportion be taken at Duke.

**Certificate Programs.** A certificate program is a course of study that affords a distinctive, usually interdisciplinary, approach to a subject that is not available within any single academic unit. All certificate programs consist of at least six courses, four of which are at the 100-level or above and at least one of which is either an introductory or capstone course. Eligible undergraduates electing to satisfy the requirements of a certificate program may use for that purpose no more than two courses that are also used to satisfy the requirements of any other major, minor, or other certificate program. At least half the courses taken to satisfy a certificate must be taken at Duke although individual programs may require that a greater proportion be taken at Duke.

Certificate programs are available in: Early Childhood Education Studies; Film and Video; Genetics; Health Policy; Human Development; Integrated Arts; Judaic Studies; Latin American Studies; Markets and Management Studies; Neurosciences; Perspectives on Marxism and Society; Primatology; Science, Technology, and Human Values; and Study of Sexualities.

Fuller descriptions of these certificate programs appear in the chapters "Specialized Programs Within Academic Units" and "Courses and Academic Programs."

**Restrictions on Majors, Minors, Certificates.** A student must declare one major and may declare a second (although not a third) major. The combined number of majors, minors, and certificate programs may not exceed three. Thus, a student may declare as a maximum: two majors and either a minor or a certificate program; a major and two minors; a major and two certificate programs; or a major, a minor, and a certificate program.

**Small Group Learning Experiences.** By supplementing the classroom and lecture methods of instruction, small group learning experience courses assure students opportunities to engage in discussion, develop skills, refine judgment, and defend ideas when challenged. A *seminar* (ordinarily indicated by the suffix S) is an independent course of twelve to fifteen (exceptionally to twenty) students who, together with an instructor, engage in disciplined discussion. The number of meeting hours per term is the same as for regular courses of equivalent credit. Instructors are encouraged to present to each student at the end of the term a written evaluation of the student's work. A *tutorial* (T) is a group of one to five students and an instructor meeting for discussion which is independent of any other course. For *independent study* students pursue their own interests in reading, research, and writing, but meet with an instructor for guidance and discussion. See the section on independent study in the chapter "Academic Procedures and Information."

To meet the first-year seminar requirement, students who transfer to Duke with sophomore standing are required to complete a seminar by the end of their sophomore year at Duke or to submit documentation that they completed a seminar class at the college they attended previously.

While *discussion sections* (D) and *preceptorials* (P) do not satisfy the formal Small Group Learning Experience in the college, they offer additional opportunities for students to participate in small classes. A discussion section, with an enrollment limit set by the individual department, is an integral part of a larger regular course, and every member of the class is enrolled.



A *preceptorial (P)* is a group of usually no more than twelve students and an instructor in which discussion is the primary component; it is an additional and optional unit attached to a regular course involving one or more extra meetings per week. No additional course credit is given for a preceptorial.

Instructors in all courses that satisfy the requirements for small group learning experiences, including independent study, must meet with the students at least once every two weeks during the spring/fall semesters and at least once every week during the summer terms. The requirements for small group learning experiences are listed under Program I, above.

Preceptorials, discussion sections, seminars, and tutorials may not be taken on the pass/fail basis, unless the course is offered only on that basis.

**Course Credits.** Thirty-four semester courses are required for graduation, including a maximum of two courses passed with a grade of *D*. Twelve courses must be at the advanced (100-200) level. The thirty-four course credits may include (1) no more than one semester-course credit in physical education activity courses; (2) no more than four semester-course credits in dance/American Dance Festival technique/performance courses (i.e., a total of eight half-credit courses); (3) no more than two credits for house courses; (4) no more than six credits for courses taken in professional schools; (5) no more than one semester-course credit from academic internships; and (6) no more than four semester-course credits in military science. Certain military science courses listed as carrying credit do not count toward graduation but appear on a student's permanent academic record. Military science courses, like professional school and all physical education courses, do not satisfy general studies (area of knowledge) requirements. (American Dance Festival courses are included in the total limitation on dance technique/performance courses as noted above in this paragraph.) For limitations on transfer credit and Advanced Placement credit, see the sections "Advanced Placement" and "Transfer of Work Elsewhere" in the chapter "Academic Procedures and Information" and the "Residence" section below.

**Residence.** A residence period of eight semesters is the typical amount of time a student may take to earn either the Bachelor of Arts or the Bachelor of Science degree. This period may be extended for one or two semesters by a student's academic dean for legitimate reasons, if it seems probable that an extension will enable the student to complete all remaining requirements for graduation. A student will not be permitted residence of more than ten semesters in order to be graduated.

For the minimum residence period, at least seventeen courses must be satisfactorily completed at Duke, including the courses needed to meet the senior year residence requirement. (For the purposes of the residence requirement, advanced placement credits are not considered as courses taken at Duke; see the section "Advanced Placement" in the chapter "Academic Procedures and Information.") If only seventeen courses are taken at Duke, they must include the student's last eight courses. A student with more than seventeen courses at Duke may take two of the last eight courses at another approved institution. A student who has completed twenty-six courses at Duke may take four of the last eight courses at another approved institution. Courses taken elsewhere must be approved in advance by the appropriate director of undergraduate studies and the student's academic dean.

Former students of Trinity College or the Woman's College who have been out of college for at least six years, and left in good standing, may, with certain provisos, take up to eight semester-courses in another institution of approved standing in final fulfillment of graduation requirements. Further information can be obtained from the associate dean of Trinity College of Arts and Sciences responsible for coordinating readmission.



## PROGRAM II

**Nature and Purpose.** Students who believe that their intellectual interests and talents would be better served outside the regular curriculum options under Program I are encouraged to explore the academic option offered through Program II. If admitted into Program II, students follow individualized degree programs to examine and explore a topic, question, or theme as a core area of study which is not generally available as a course of study within Program I. As degree candidates in Program II, students separate themselves from the requirements and options of Program I including the requirement for a major and the options of multiple majors and minors.

Students who seek out Program II, are, typically, those who find that their intellectual interests cross departmental boundaries or who perceive areas of learning in clusters other than those of the current departmental units of the University. Program II graduates have gone on to graduate and professional schools around the country and to satisfying positions in many areas of employment. They have won important awards, including Rhodes and Fulbright Scholarships, and have received national recognition for career success. Among the many topics for Program II have been Architectural Design, Bioethics, Dramatic Literacy, the Epic in Music and Literature, Planetary and Evolutionary Biology, and U.S. National Security.

**Admission.** If interested in Program II, students should first attend an information session, then confer with faculty or directors of undergraduate studies in the departments closest to their interests, and with the academic dean for Program II. Students will select a faculty advisor in one of the departments or programs of Trinity College; that department or program will become the sponsor for the student. Admission to Program II requires students to propose a topic, question, or theme for the degree program and to plan a special curriculum adapted to their individual interests and talents. The student and faculty advisor together assess the student's background, interests, and ambitions and evaluate the resources at the University, or outside it, as means of satisfying those ambitions.

The curricular program proposed by a Program II candidate must address the student's specific interests and must also meet the general expectations for a liberal education in Trinity College. It must be a coherent plan for learning rather than a sampler of interesting courses and should incorporate the depth and breadth of study expected of a liberal education in Trinity College. The program must be approved by the sponsoring department or program and also by the Committee on Program II of the Faculty Council of Arts and Sciences. Programs may be proposed for either the Bachelor of Arts or the Bachelor of Science degree; in the latter case, the sponsoring department must offer a Program I major within the B.S. degree option.

Upon endorsement by the Program II Committee, the program becomes an obligation assumed by the student, although it may be modified, if necessary, with the approval of the advisor and the Committee on Program II. Until formally accepted into Program II, a student should register for courses to satisfy the curricular requirements for Program I. Students who withdraw from Program II for any reason assume all requirements of Program I. Students will be accepted into Program II only after their first semester at Duke; they are ineligible for admission after their junior year. Further information and applications may be obtained from the Premajor Advising Center and from the office of the academic dean responsible for Program II.

**General Requirements:** Apart from the requirements arising from the approved plan of work, a Program II student must satisfy certain general requirements: thirty-four semester-course credits for graduation; curricular breadth; the regulations on military science, house, professional school, and physical activity and dance courses;

and residence, although the regulation relating to the last eight courses may be adjusted to suit the student's approved plan of work. Graduation with distinction is available for qualified students in Program II. See the section on honors in the chapter, "Academic Procedures and Information."

## **COMBINATION PROGRAMS OF TRINITY COLLEGE AND DUKE PROFESSIONAL SCHOOLS**

A student interested in attending a Duke professional school may, upon meeting certain requirements, combine the senior year in Trinity College of Arts and Sciences with the first year in the professional school. To qualify the student must (1) successfully complete twenty-six semester courses in Trinity College; (2) fulfill all other degree requirements in Trinity College except for eight elective courses; (3) obtain the approval of the appropriate preprofessional advisor and academic dean in Trinity College; and (4) be admitted to the professional school. If the student's application to the professional school is accepted, the student transfers to the professional school for the fourth year and begins work on the professional degree. Upon successful completion of the work in the first year of the professional school, the baccalaureate degree is awarded to the student. The undergraduate record notes the student's enrollment in the combination program, the name of the professional school, the date of graduation from Trinity College, and the degree awarded, but it does not include courses taken in the professional school. Counseling and additional information are available from the preprofessional advisors.

## **PREPARATION FOR GRADUATE AND PROFESSIONAL SCHOOLS**

Students planning to enter a graduate or professional school should consult their faculty advisors, director of undergraduate studies, or academic dean at the earliest opportunity. Since many graduate and professional schools require special tests for students seeking admission, information regarding requirements should also be obtained from the catalogs of the appropriate schools. Applications for the testing programs required for admission to graduate or professional schools can be obtained from the appropriate pre-professional school or pre-graduate school advisor in Trinity College of Arts and Sciences or from the Office of Counseling and Psychological Services (CAPS).

**Graduate Schools of Arts and Sciences.** Students interested in obtaining a master of science, master of arts, or doctor of philosophy degree should discuss their plans as early as possible with faculty in the proposed field of advanced study and obtain a copy of "Preparing for Graduate Study in the Arts and Sciences," a handbook available from the Premajor Advising Center or 04 Allen Building. As undergraduates, they should become involved in research which may involve laboratory work, advanced seminars, or independent study. Many graduate schools require a reading knowledge of a foreign language. Information on this and other requirements is available in the bulletins of specific graduate programs and in the *Directory of Graduate Programs* published by the GRE board and Council of Graduate Schools. It may also be included in the "Handbook for Majors" for the major department. A research mentor, a faculty advisor, and the Ph.D. advisor in the major department are the best resources for advice about graduate school in the arts and sciences. General advice may be sought from the advisor for pre-graduate study, 04 Allen Building.

**Graduate Schools of Engineering.** Students interested in graduate work in engineering should consult the dean of the School of Engineering or the director of graduate studies in one of the engineering departments. Most engineering graduate

schools require that a candidate have the equivalent of a Bachelor of Science in Engineering degree; however, students in the natural and social sciences may obtain conditional admission if they have a sufficient background in mathematics.

**Graduate Schools of Business.** Students seeking information about graduate schools of business should consult the advisor in Trinity College. In preparing for graduate business school, students should gain a good liberal arts background, choosing courses that will help them develop communication skills, analytical skills, and an understanding of human nature. Students have often chosen such courses as Computer Science 1, Economics 1D and 2D (or 51 and 52), Economics 83, and Mathematics 31 as those which develop analytical skills. For further information concerning undergraduate preparation, see the *Prebusiness Handbook for Duke Seniors and Alumni* and *The Official Guide to MBA Programs* published by the Graduate Management Admission Council; these publications and other resource materials are available in the Prebusiness Advising Office, 03 Allen Building.

**Medical and Dental Schools.** Students planning to enter schools of medicine and dentistry can prepare for admission by completing any of the regular departmental majors in Program I or by completing Program II, and by taking those courses required by the professional schools of their choice. Virtually all medical schools and most schools of dentistry require the same basic group of college premedical courses—a year of biology, a year each of inorganic and organic chemistry, and a year of general physics. In addition, many schools require a year of English and courses in the humanities or social sciences. About a fifth of all medical schools require a year of college mathematics and some specify calculus, statistics, or computer science. For a complete listing of these and any additional course requirements set by each school, consult *Medical School Admission Requirements*, published by the Association of American Medical Colleges or *Admission Requirements of U.S. and Canadian Dental Schools*, published by the American Association of Dental Schools. These and similar resources for schools of optometry and veterinary medicine are located in the Health Professions Advising Office. Students should discuss their programs of study with their major advisors, academic deans, and with the advisor for the health professions.

**Graduate Programs in the Health Professions.** Students interested in careers as physical therapists, health administrators, or others of the allied health professions should prepare with course work in the natural sciences and behavioral sciences within a liberal arts curriculum. Descriptive literature on each of the allied health schools and professions is part of the library maintained in the Health Professions Advising Office, where students will also find publications of selected advanced degree programs in biomedical research, including the combined M.D./Ph.D. degree programs.

**Law Schools.** Students who plan to prepare for law school and a career in law should seek breadth in their undergraduate course program with specialization in one or more areas. They may choose virtually any field for their major work. Though no specific courses are required, prelaw students have often chosen from among the following: Economics 1D, 2D, 83; English 117S; History 21D, 22D, 91D, 91S, 92, 92D, 92S, 241-242; Philosophy 48; Political Science 91D, 127, 207S; Public Policy Studies 55D; Sociology 10D and 157.

For a fuller discussion of undergraduate preparation for the study of law, students should refer to the *Duke Prelaw Handbook* or the *Prelaw Handbook* published by the Association of American Law Schools and the Law School Admission Council, or consult the prelaw advisor in the college.

**Theological Schools and Religious Work.** Students contemplating theological study should correspond with appropriate schools. Students should also confer with



the authorities of their respective religious judicatories to determine requirements for a successful application to the school of their choice. Generally speaking, appropriate preparation for theological study would include the following subjects: English language and literature; history, including non-Western cultures as well as European and American; philosophy, particularly its history and its methods; natural sciences, both the physical and the life sciences; psychology, sociology, and anthropology; the fine arts and music; biblical and modern languages; religion, both in the Judeo-Christian and in the Near and Far Eastern traditions.

This kind of course work introduces the student to ways of thinking that will be germane to theological study. Some theological schools require various languages for admission. This may include a year of language study at the college level. It may also include biblical language skill, Greek and/or Hebrew. More detailed information about theological education may be obtained from the director of admissions of the Divinity School.

## The School of Engineering

Duke University offers in the School of Engineering programs of study which lead to the degree of Bachelor of Science in Engineering. Four programs are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET). These programs are biomedical engineering, civil engineering, electrical engineering, and mechanical engineering. These accredited programs, and special programs of study in interdisciplinary fields, are offered by the Departments of Biomedical Engineering, Civil and Environmental Engineering, Electrical and Computer Engineering, and Mechanical Engineering and Materials Science.

For graduation with a Bachelor of Science in Engineering degree, a student must complete successfully a minimum of thirty-four semester courses. These thirty-four semester courses must include the following:

### General Requirements\*

|   |        |   |
|---|--------|---|
| Writing . . . . .                           | 1 s.c. | This requirement is met by completing a University Writing Course.  |
| Mathematics . . . . .                       | 4 s.c. | This requirement is met by completing Mathematics 31, 32, and 103; plus 104 or 111 or 135.†   |
| Natural Science . . . . .                   | 4 s.c. | This requirement is met by completing Chemistry 11L, Physics 51L and 52L, and an elective course in one of the natural science departments which presents fundamental knowledge about nature and its phenomena, preferably including quantitative expression.†§   |
| Humanities<br>and Social Sciences . . . . . | 5 s.c. | This requirement is met by completion of five courses selected from at least three of the following four areas of knowledge: Arts and Literatures (AL), Civilizations (CZ), Foreign Languages (FL), and Social Sciences (SS). At least one course must be classified SS. In order to provide depth in the subject matter, at least two of the five courses must be selected from a single department and at least one of those courses must be 100-level or above. This program of courses should reflect a thematic coherence and fulfill an objective appropriate to the engineering profession. Courses selected must be those which present essential subject matter and substance of the discipline. |



Engineering and  
Applied Sciences . . . . . 4 s.c.

This requirement is met by completion of one course from each of four of the following six areas: electrical science, information and computer science, mechanics (solid and fluid), materials science, systems analysis, and thermal science and transfer processes. See departmental requirements, which follow, for any specific courses to be included.

Digital Computation

Students are expected to have acquired digital-computer programming capability before their sophomore year. The programming capability may be satisfied by Advanced Placement or by passing Engineering 53L or Computer Science 6 or 100E.

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\*No more than 1 s.c. credit in physical education activity and 1 s.c. credit in music activity can be used to meet Bachelor of Science in Engineering degree requirements. House courses may not be used to meet BSE requirements.

†A minimum of 9 s.c. credits in mathematics, natural science, and statistics are required.

§Physics 41L and 42L may be substituted for Physics 51L and 52L. Courses in mathematics, statistics, and computer science will not meet the elective requirement. *A list of disallowed courses is maintained in the dean's office.*

### Departmental Requirements

Departmental  
Specifications . . . . . 16 s.c.

The department administering the major field of study will specify this requirement. In general, it will consist of both required courses and electives to be planned in consultation with the departmental advisor. Including the 4 s.c. in engineering and applied sciences listed under general requirements, a total of 13.0 s.c. in engineering work are required. See the individual departmental requirements, which follow.

\*Total Minimum  
Requirement . . . . . 34 s.c.

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\*A maximum of two semester courses of junior or senior level air science, military science, or naval science course work may be counted in satisfying the minimum requirements of thirty-four semester courses for a baccalaureate degree in engineering. These courses must be included in the sixteen semester courses listed under departmental requirements. All other courses completed in air, military, or naval science are taken in addition to the minimum program.

### Biomedical Engineering Departmental Requirements

All general requirements and departmental requirements comprising the accredited biomedical engineering major are incorporated in the following sequence, only one of several possible sequences. The student is encouraged to choose electives and select a sequence which develops broad intellectual interests.

### Freshman Year

| First Semester                             | Courses | Second Semester                                | Courses |
|--|---------|--|---------|
| Chemistry 11L .....                        | 1       | Chemistry 12L .....                            | 1       |
| University Writing Course .....            | 1       | Physics 51L .....                              | 1       |
| Mathematics 31 .....                       | 1       | Mathematics 32 .....                           | 1       |
| Engineering 53L or Social Science or ..... |         | Social Science or Humanities Elective or ..... |         |
| Humanities Elective .....                  | 1       | Engineering 53L .....                          | 1       |
| Total .....                                | 4       | Total .....                                    | 4       |

### Sophomore Year

| First Semester                       | Courses | Second Semester                             | Courses |
|--------------------------------------|---------|---|---------|
| Physics 52L .....                    | 1       | Biomedical Engineering 163. ....            | 1       |
| Electrical Engineering 61 .....      | 1       | Elective .....                              | 1       |
| Mathematics 103. ....                | 1       | Mathematics 111 .....                       | 1       |
| †Biomedical Engineering 83L or ..... |         | Social Science or Humanities Elective. .... | 1       |
| Engineering 83L .....                | 1       | Life Science Elective. ....                 | 1       |
| Elective. ....                       | 1       | Total .....                                 | 5       |
| Total .....                          | 5       |   |         |

### Junior Year

| First Semester                              | Courses | Second Semester                     | Courses |
|---|---------|-------------------------------------|---------|
| Biomedical Engineering 110 or .....         |         | Biomedical Engineering 145 or ..... |         |
| Engineering 75L .....                       | 1       | Mechanical Engineering 101L .....   | 1       |
| Electrical Engineering 64 or .....          |         | or Electrical Engineering 176. .... | 1       |
| Biomedical Engineering 171. ....            | 1       | Life Science Elective .....         | 1       |
| Biomedical Engineering 101 .....            | 1       | Biomedical Engineering 164 .....    | 1       |
| Social Science or Humanities Elective ..... | 1       | Mathematics 114. ....               | 1       |
| Total .....                                 | 4       | Total .....                         | 4       |

### Senior Year

| First Semester                        | Courses | Second Semester                             | Courses |
|---------------------------------------|---------|---|---------|
| Biomedical Engineering 207 .....      | 1       | Biomedical Engineering Elective .....       | 1       |
| Statistics 113 .....                  | 1       | Biomedical Engineering Elective .....       | 1       |
| Biomedical Engineering Elective. .... | 1       | Social Science or Humanities Elective. .... | 1       |
| Biomedical Engineering Elective. .... | 1       | Social Science or Humanities Elective. .... | 1       |
| Total .....                           | 4       | Total .....                                 | 4       |

†Biomedical Engineering 83 is not required for students who complete a second major in electrical engineering.

Students preparing for medical school should schedule Chemistry 151L and 152L, and *two* life science electives before the end of their junior year by deferring some required courses to the senior year. Biomedical engineering electives include all courses with biomedical engineering numbers other than required courses. Mechanical Engineering 126 may be taken also as a biomedical engineering elective.

### Civil and Environmental Engineering Departmental Requirements

All general and departmental requirements comprising the accredited civil engineering major are incorporated in the following typical sequence of courses. This sequence is only one of several possible sequences and students are encouraged to work closely with their advisor in choosing electives and selecting a sequence of courses to develop their individual interests.

### Freshman Year

| First Semester                    | Courses | Second Semester                          | Courses |
|-----------------------------------|---------|--|---------|
| Chemistry 11L .....               | 1       | Engineering 24L or Engineering 25L ..... | 1       |
| Mathematics 31L .....             | 1       | Mathematics 32L .....                    | 1       |
| Engineering 53L or Elective ..... | 1       | Elective or Engineering 53L .....        | 1       |
| University Writing Course .....   | 1       | Physics 51L .....                        | 1       |
| Total .....                       | 4       | Total .....                              | 4       |

### Sophomore Year

| First Semester         | Courses | Second Semester                          | Courses |
|------------------------|---------|--|---------|
| Engineering 75L .....  | 1       | Engineering 123L .....                   | 1       |
| Mathematics 103L ..... | 1       | Mathematics 111L .....                   | 1       |
| Physics 52L .....      | 1       | Engineering 25L or Engineering 24L ..... | 1       |
| Elective .....         | 1       | Elective .....                           | 1       |
| Total .....            | 4       | Total .....                              | 4       |

### Junior Year

| First Semester                   | Courses | Second Semester                  | Courses |
|----------------------------------|---------|----------------------------------|---------|
| Civil Engineering 122L .....     | 1       | Engineering 150L .....           | 1       |
| Civil Engineering 131L .....     | 1       | Elective or Statistics 113 ..... | 1       |
| Statistics 113 or Elective ..... | 1       | Elective .....                   | 1       |
| Engineering 115L .....           | 1       | Elective .....                   | 1       |
| Elective .....                   | 1       | Elective .....                   | 1       |
| Total .....                      | 5       | Total .....                      | 5       |

### Senior Year

| First Semester | Courses | Second Semester             | Courses |
|----------------|---------|-----------------------------|---------|
| Elective ..... | 1       | Civil Engineering 192 ..... | 1       |
| Elective ..... | 1       | Elective .....              | 1       |
| Elective ..... | 1       | Elective .....              | 1       |
| Elective ..... | 1       | Elective .....              | 1       |
| Total .....    | 4       | Total .....                 | 4       |

The program of electives shall include: at least one of Electrical Engineering 61L, Electrical Engineering 148L, Engineering 83L, Mechanical Engineering 101L or Biomedical Engineering 145; at least five courses in humanities and social sciences; at least one course in the natural sciences; at least two courses chosen from Civil Engineering 116, 123L, and 139L; at least two other civil engineering elective courses at the 100 or 200 level. (Students planning to proceed to graduate school are advised to elect 200-level courses.) Any higher level environmental engineering course may be substituted for Engineering 24L and any higher level structures course may be substituted for Engineering 25L.

Students should also note that, in order to meet professional accreditation requirements of the American Society of Civil Engineers, the program of electives should be selected to ensure that the engineering work taken contains at least 8.5 s.c. equivalents in engineering science and at least 4.25 s.c. equivalents in engineering design. (More information is available from the departmental office, the director of undergraduate studies, and the faculty advisors.)

### Electrical and Computer Engineering Departmental Requirements

The general requirements and departmental requirements comprising the accredited electrical engineering major are all incorporated in the following program. This program is presented as a guide to assist students in planning their four-year program and should not be viewed as an inflexible sequencing of courses.

### Freshman Year

| First Semester   | Courses |
|--|---------|
| Mathematics 31L .....  | 1       |
| Chemistry 11L .....  | 1       |
| University Writing Course .....  | 1       |
| Computer Science 6 or 100E or Engineering<br>53L or Social Science-Humanities Elective ... | 1       |
| Total .....  | 4       |

| Second Semester  | Courses |
|--|---------|
| Mathematics 32 .....   | 1       |
| Physics 51L .....  | 1       |
| Approved Elective .....  | 1       |
| Computer Science 6 or 100E or Engineering<br>53L or Social Science-Humanities Elective ... | 1       |
| Total .....  | 4       |

### Sophomore Year

| First Semester                           | Courses |
|--|---------|
| Mathematics 103 .....                    | 1       |
| Electrical Engineering 61L .....         | 1       |
| Physics 52L .....                        | 1       |
| Social Science-Humanities Elective ..... | 1       |
| Total .....                              | 4       |

| Second Semester                          | Courses |
|--|---------|
| †Mathematics 1A .....                    | 1       |
| Electrical Engineering 62L .....         | 1       |
| Electrical Engineering 64 .....          | 1       |
| Social Science-Humanities Elective ..... | 1       |
| Approved Elective .....                  | 1       |
| Total .....                              | 5       |

### Junior Year

| First Semester                           | Courses |
|--|---------|
| †Mathematics 1B .....                    | 1       |
| *Electrical Engineering 1A .....         | 1       |
| Electrical Engineering 163L .....        | 1       |
| Social Science-Humanities Elective ..... | 1       |
| Total .....                              | 4       |

| Second Semester                          | Courses |
|--|---------|
| †Mathematics 1C .....                    | 1       |
| Electrical Engineering 170 .....         | 1       |
| *Electrical Engineering 1B .....         | 1       |
| Social Science-Humanities Elective ..... | 1       |
| §Natural Science Elective .....          | 1       |
| Total .....                              | 5       |

### Senior Year

| First Semester                        | Courses |
|---------------------------------------|---------|
| *Electrical Engineering 2A .....      | 1       |
| Electrical Engineering Elective ..... | 1       |
| †Engineering Elective .....           | 1       |
| Approved Elective .....               | 1       |
| Total .....                           | 4       |

| Second Semester                            | Courses |
|--|---------|
| Electrical Engineering Design Course ..... | 1       |
| *Electrical Engineering 2B .....           | 1       |
| Approved Elective .....                    | 1       |
| Approved Elective .....                    | 1       |
| Total .....                                | 4       |

\*To be selected from two of the following areas: computer engineering; signal processing and communications; solid state electronics and circuits; systems and robotics; electromagnetic fields and optics.

†Students interested in computer engineering, signal processing and communications, systems and robotics, or power electronics should select Mathematics 104, 131, and 135 or Statistics 113. Students interested in solid state electronics and circuits or electromagnetic fields and optics should select Mathematics 111, 114, and 135 or Statistics 113.

‡To be selected from: mechanics (Engineering 75L or 123L, Mechanical Engineering 126L, or Biomedical Engineering 110); thermal sciences (Mechanical Engineering 101L, Electrical Engineering 176, Mechanical Engineering 150L, or Biomedical Engineering 145 or 202); or materials science (Engineering 83L or Biomedical Engineering 215).

§The following courses are recommended: Chemistry 12L; Physics 100, 105, 176, 181, and 185; Biology 21L.

**Note:** The selection of approved electives should take into account a departmental requirement that a student must have accumulated by graduation time the equivalent of 13.0 engineering courses, including an engineering design course to be taken in the junior or senior year of the program. This course must have as a prerequisite at least one course in the discipline; currently, Electrical Engineering 164, 251, 261, and 275 are approved. Engineering 23, Engineering 174, and Engineering 175 may not be counted toward the departmental requirement of 13.0 engineering courses. Two courses may be selected from any two of the following areas: information and computer science



(Engineering 53L or Computer Science 6 or 100E may be used to satisfy this requirement), mechanics, materials science, and thermal sciences.

An up-to-date list of acceptable engineering design and engineering science courses may be obtained from the departmental office.

### Mechanical Engineering and Materials Science Departmental Requirements

The general requirements and departmental requirements comprising the accredited mechanical engineering major are all incorporated in the following program. This sequence of the courses is presented as an overview of the program and is one of two recommended sequences of the course requirements.

#### Freshman Year

| First Semester                     | Courses | Second Semester                    | Courses |
|------------------------------------|---------|------------------------------------|---------|
| Mathematics 31L .....              | 1       | Mathematics 32L .....              | 1       |
| Chemistry 11L .....                | 1       | Physics 51L .....                  | 1       |
| University Writing Course .....    | 1       | Engineering 83L .....              | 1       |
| Engineering 53L or *Elective ..... | 1       | *Elective or Engineering 53L ..... | 1       |
| Total .....                        | 4       | Total .....                        | 4       |

#### Sophomore Year

| First Semester                     | Courses | Second Semester                   | Courses |
|------------------------------------|---------|-----------------------------------|---------|
| Mathematics 103L .....             | 1       | Mathematics 111L .....            | 1       |
| Physics 52L .....                  | 1       | Mechanical Engineering 101L ..... | 1       |
| Engineering 75L .....              | 1       | Engineering 123L .....            | 1       |
| Engineering 83L or *Elective ..... | 1       | *Elective .....                   | 1       |
| Total .....                        | 4       | Total .....                       | 4       |

#### Junior Year

| First Semester                        | Courses | Second Semester                                  | Courses |
|---------------------------------------|---------|--|---------|
| Mechanical Engineering 125L .....     | 1       | Mechanical Engineering 126L .....                | 1       |
| Mechanical Engineering Elective ..... | 1       | ***Electrical Engineering 148L .....             | 1       |
| **Natural Science Elective .....      | 1       | †Mathematics or Natural Science Elective** ..... | 1       |
| *Elective .....                       | 1       | ‡Quantitative Elective .....                     | 1       |
| *Elective .....                       | 1       | *Elective .....                                  | 1       |
| Total .....                           | 5       | Total .....                                      | 5       |

#### Senior Year

| First Semester                         | Courses | Second Semester                        | Courses |
|--|---------|--|---------|
| Mechanical Engineering 150L .....      | 1       | Mechanical Engineering 160L .....      | 1       |
| Mechanical Engineering 141L .....      | 1       | §Mechanical Engineering Elective ..... | 1       |
| §Mechanical Engineering Elective ..... | 1       | *Elective .....                        | 1       |
| *Elective .....                        | 1       | *Elective .....                        | 1       |
| Total .....                            | 4       | Total .....                            | 4       |

\*Part of a program of approved electives planned with the student's faculty advisor to suit individual interests and abilities. Five of these nine electives must be selected to meet the humanities and social sciences requirements of the School of Engineering. Also, three of the nine electives must be 100 level or higher, with the exception that engineering courses below the 100 level taken during the freshman or sophomore years may substitute for two of these 100-level electives. ROTC courses cannot be counted toward the 100-level requirement.

\*\*A list of disallowed courses is maintained in the dean's office.

\*\*\*With the approval of the director of undergraduate studies, Electrical Engineering 61L or Physics 171L may be substituted.

†Including statistics, with the exception of Statistics 10. See recommendations below.

‡Restricted to mathematics, statistics, or computer science at the 100-level or higher, or engineering at the 200 level. The following are strongly recommended: Mathematics 114, Statistics 113, or Computer Science 150. Students interested in graduate studies in engineering should take Mathematics 114.

§Restricted to 100-level or higher.

**Declaration of Major.** A student is urged to declare a major by the time of registration for the first semester of the sophomore year, but is required to do so by the time of registration for the first semester of the junior year. Declaration of major is accomplished by completing a form available in the Office of the Dean of Engineering.

**Double Major.** If an engineering student completes simultaneously the requirements for a departmental major in arts and sciences and the requirements for a Bachelor of Science in Engineering degree, or satisfies simultaneously the requirements for two engineering majors, the official record will indicate this fact. However, the director of undergraduate studies for the second major must certify that the departmental major requirements have been met. The student must initiate the procedure, either through the dean of the School of Engineering or through the director of undergraduate studies in the second department. The completion of the requirements for the major in this department must be confirmed no later than the time of registration for the final semester. Courses which are common to both majors shall be counted toward satisfying the requirements of both majors.

**IDEAS.** These interdisciplinary programs in engineering and applied science, leading to the Bachelor of Science in Engineering degree, provide opportunities for students to establish special majors in interdisciplinary fields such as computer engineering, environmental engineering, and materials science. Programs with a broad foundation in the engineering sciences also may be developed under this program by those who intend to enter nonengineering professions. Although not individually accredited, these programs satisfy the national engineering accreditation criteria.

Any student, in consultation with the advisor or another faculty member, may propose a unique combination of courses designed to meet particular career objectives. A proposal must be submitted to the associate dean of the School of Engineering and the Engineering Faculty Council for approval; it may be submitted as early as the second semester of the freshman year and must be submitted before the beginning of the senior year. The proposal must include a letter stating the student's reasons for pursuing the suggested program of study.

**Bachelor of Science in Engineering/Master of Science Program.** This program provides students with an opportunity to plan a coordinated five-year program of studies in the School of Engineering leading to both the Bachelor of Science in Engineering and Master of Science degrees. Application for admission to this integrated program may be made during the junior or senior year. Provisional admission to the Graduate School may be granted when the student enrolls for the semester during which the Bachelor of Science in Engineering degree requirements will be completed. Graduate level courses during this period which are in excess of Bachelor of Science in Engineering requirements may be credited toward fulfillment of the Master of Science degree requirements.

**International Honors Program.** The International Honors Program is a certificate program consisting of six to eight semester courses, depending on the foreign language level proficiency of the student. All of the IHP course requirements may, with sufficiently advanced planning, fulfill humanities and social sciences or approved Elective requirements which are encompassed in the schools' accredited engineering programs. Early planning and advising are essential to fulfilling all IHP requirements as part of the baccalaureate degree program. Specific program requirements and an application may be obtained in the office of the dean of engineering.

**Certificate Program in Architectural Engineering.** The objective of this interdisciplinary program is to provide students with an understanding of the relationships between the design elements of buildings and construction processes. This certificate program is available only to students enrolled in the School of Engineering. Specific program requirements may be obtained in the Office of the Dean of Engineering.

**Master of Engineering Management.** This program offers engineering students exposure to both business and law as well as advanced engineering. Open to students after completion of the accredited bachelor's degree in engineering, it requires completion of an engineering internship, four graduate level engineering courses, three business courses, and one law course. Specific program requirements and application forms may be obtained from the Master of Engineering Management program office in Hudson Hall.

**Residence Requirements.** At least seventeen semester courses must be completed satisfactorily at Duke. This must include the work of the final two semesters, with the following exceptions: the student who has completed more than four full semesters of work at Duke may take the last two courses elsewhere; others may take the last course elsewhere. The courses taken elsewhere must be approved in advance by the students major advisor and academic dean.

**Pass/Fail Grading Option.** With the consent of the instructor and the faculty advisor, an engineering student may choose to be graded on a pass/fail basis in up to four unrestricted electives or social sciences-humanities electives within the thirty-four-course program. A student may take no more than one course on a pass/fail basis each semester.

**Repetition of Courses.** An engineering student who has earned a grade of *D-*, *D*, or *D+* in a required mathematics course or a required engineering course may, with permission of his or her advisor, director of undergraduate studies, and academic dean, repeat the course. Both grades will remain on the students record. Only one credit may be counted toward satisfying continuation requirements and toward fulfilling graduation requirements.

**Continuation Requirements.** A student must achieve a satisfactory record of academic performance each semester and make satisfactory progress toward graduation to remain enrolled in the university. A student must pass at least three courses in each semester, except for the first semester of the freshman year, in which at least two courses must be passed.

A student who fails to meet this continuation requirement must leave the university for at least two semesters. A complete summer session may be counted as a semester. Following application for readmission, return must be approved by the dean and the director of undergraduate studies in the students major department. If the student thereafter fails to pass three courses in a semester, permanent dismissal from the university usually results. A student who enrolls in more than four courses in a given semester and fails two or more of them will not be permitted to enroll for more than four courses in the following semester without approval of the dean. In addition, a student may be dismissed temporarily or permanently for failing to make satisfactory progress toward graduation, including satisfactory progress toward fulfillment of curricular requirements within ten semesters.

The term satisfactory progress shall be defined also by the following schedule:

1. To begin enrollment in the second year, a student must have passed 6 s.c. at Duke and earned *P*, *C-*, or better in 4 s.c.
2. To begin enrollment in the third year, a student must have passed 13 s.c. at Duke and earned *P*, *C-*, or better in 11 s.c.
3. To begin enrollment in the fourth year, a student must have passed 20 s.c. at Duke and earned *P*, *C-*, or better in 18 s.c.
4. To begin enrollment in the fifth year, a student must have passed 27 s.c. at Duke and earned *P*, *C-*, or better in 25 s.c.

**Grade Requirement for Graduation.** Of the thirty-four semester courses which fulfill the specified categories in the Bachelor of Science in Engineering degree requirements, thirty-two or their equivalent in number must be passed with grades of *P*, *C-*, or better.



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*Academic Procedures and Information*



## Advanced Placement

Scores on the tests discussed below and documented previous educational experience are the criteria used to determine a student's qualifications for certain advanced courses. If questions arise, students should consult the director of undergraduate studies in the appropriate department or the university registrar.

**College Board Advanced Placement Program (AP) Examinations.** A score of 4 or 5 on College Board Advanced Placement Program Examinations, taken prior to matriculation in college, is the basis for recording AP courses on a student's permanent Duke record as well as the basis for consideration of placement in advanced courses in art, biology, chemistry, computer science, economics, English, French, German, history, Latin, music, physics (see below), political science, psychology, Spanish, and statistics. The Department of Mathematics will also consider a score of 3 for placement beyond the introductory course. The record of a student presenting such a score and desiring to continue in the same subject at Duke will be evaluated for placement in an advanced course. Departmental policies regarding advanced placement may vary. In the case of French, German, Latin, and Spanish, AP scores of 4 or 5 may result in placement in courses at the 100 level; approval of the director of undergraduate studies or supervisor of freshman instruction in the appropriate department is required before final placement is made. See next section concerning policies in the Department of Physics.

**Advanced Placement in Physics.** Neither credit nor advanced placement are given for a score below 5 on the Advanced Placement (AP) "Physics-B" exam. Exceptional Trinity College students presenting a score of 5 on the AP "Physics-B" exam may be placed out of PHY 51 (equivalent to PHY 41 and PHY 53) with consultation of the Physics Director of Undergraduate Studies, although no credit will be granted for these courses. This option is not available to students in the School of Engineering.

For a score of 4 or 5 on the AP "Physics-C" exam the policy is as follows. (1) A score of 4 or 5 on the "Physics-C" Mechanics exam earns credit for PHY 21; a score of 4 or 5 on the "Physics-C" Electricity and Magnetism exam earns credit for PHY 22; these course numbers denote only AP credit and are not actual Duke courses. (2) To obtain credit for PHY 51 (equivalent to PHY 41 and PHY 53), a student must earn a passing grade on an equivalency exam given by the department during the first week of classes. (3) To obtain credit for PHY 52 (equivalent to PHY 42 and PHY 54), a student must have a 4 or 5 on the "Physics-C" Electricity and Magnetism exam and must earn a passing grade on an equivalency exam given by the department during the first week of classes.

To be invited to take the equivalency exam, students must have the testing agency submit their AP scores to the Office of the University Registrar as soon as possible, but no later than the first day of classes. A letter will be sent to qualified students late in the summer giving details about the equivalency exam. *Under no circumstances will a student be allowed to take the equivalency exam other than the scheduled time during the first week of classes of the first semester at Duke.*

AP courses completed with a score of 4 or 5 will be recorded on a student's permanent Duke record. Students may use all of these courses for placement into higher level courses and to satisfy departmental major and minor requirements at Duke to the extent allowed by individual departments. Credit toward the degree is awarded for recorded AP courses according to the following policy.

In Trinity College, students may be granted up to two elective course credits toward the degree requirement of 34 course credits; up to six additional credits may be awarded for acceleration toward the degree. Specifically, the two elective as well as two acceleration credits may be included in the graduation total for students graduating after seven semesters; the two elective and six acceleration credits may be included in the graduation total for students completing their degrees after six semesters. Students wishing to graduate early must complete an early graduation form, available from their academic dean, by the end of the fifth semester of enrollment.

*For students who matriculated through January 1998:* Students in this category should review the section on the College Board Advance Placement (AP) Program Examination in the bulletin of the year they matriculated at Duke.

**International Entrance Examinations.** Duke University recognizes the International Baccalaureate Program, the French Baccalaureate, the British A-Level Examinations, the Hong Kong A-Level Examinations, the German Abitur, and the Swiss Federal Maturity Certificate. Scores acceptable for consideration are determined by the faculty and evaluated by the university registrar. Course equivalents for these programs may be recorded on a student's permanent Duke record for placement and credit according to the same policy governing use of College Board Advanced Placement (AP) courses. (see above).

**College Board Tests.** Scores on College Board Tests are the basic criteria for placement in French, German, Spanish, Latin, and mathematics. Course credit is not given for courses bypassed. The following tables will assist students in making reasonable course selections in the subjects indicated.

|              | <u>College Board<br/>Achievement Score</u> | <u>Placement</u>  |
|--------------|--|---|
| French*      | 200-370                                    | French 1  |
|              | 380-440                                    | French 12   |
|              | 450-540                                    | French 63   |
|              | 550-590                                    | French 76   |
|              | 600 plus                                   | French 100-level course   |
| German*      | 200-400                                    | German 1†   |
|              | 410-510                                    | German 65-66  |
|              | 520-590                                    | German 69   |
|              | 600 plus                                   | Third year‡   |
| Spanish*     | 200-420                                    | Spanish 1   |
|              | 430-490                                    | Spanish 12  |
|              | 500-570                                    | Spanish 63  |
|              | 580-620                                    | Spanish 76  |
|              | 630 plus                                   | Spanish 100-level course  |
| Latin        | 200-520                                    | Latin 1   |
|              | 530-630                                    | Latin 63  |
|              | 640 plus                                   | Third year‡   |
| Mathematics§ | 500-650                                    | Math. 25L   |
|              | 660-800                                    | Math. 31L, or with one<br>year of high school<br>calculus, Math. 41 |

\*In these languages students are permitted to drop back one level without loss of credit (e.g., from 100 to 76 or from 76 to 63, in French and Spanish, from 117 to 69 or from 69 to 66 in German). No credit will be allowed for courses two levels below the achievement score (e.g., students with a score of 640 in French or Spanish could not receive credit for 63, but could for 76). In no case will credit be given for 1 and 2 to students with three or more years of high school French or Spanish.

†The first year of a language may not be taken for credit by a student who has completed more than two years of that language in secondary school. In rare cases, an exception may be granted with permission of the director of undergraduate studies in the appropriate department.

‡An exception may be granted in consultation with the director of undergraduate studies.

§In the absence of an achievement test score, course placement is determined by the SAT score as follows: 670 or below—Math. 25L; 680-800—Math. 31L.



Newly admitted students who wish to continue the study of French, German, Spanish, or Latin begun in secondary school must take a College Board Achievement Test or College Board Advanced Placement (APP) Examination in that language by June of the senior year in secondary school. Students who plan to take mathematics at Duke are expected to present Scholastic Aptitude Tests College Board SAT, Mathematics Achievement (Level I or Level II), or Advanced Placement Program (APP, either level A B or level B C) scores. Placement testing is not offered during New Student Orientation in mathematics or in languages covered by the Achievement Test or Advanced Placement Examination programs of the College Board. New students who wish to continue the study of French, German, Spanish, or Latin but who found that it was not possible due to extraordinary circumstances to take the appropriate College Board examinations, may petition to take a placement test at Duke University prior to the beginning of New Student Orientation. Petitions explaining the reason a test was not taken must be received by the Coordinator of Testing, Counseling and Psychological Services, P.O. Box 90955, by July 1. If the petition is granted, a fee will be charged to cover testing costs. Because residence halls are not open before the beginning of New Student Orientation, students whose petitions are granted will also need to arrange accommodations in the Durham area.

All students who plan to take mathematics during their first semester at Duke, and who do not submit the College Board SAT or Achievement Test or Advanced Placement Program score in mathematics, should consult with the supervisor of first-year instruction in mathematics during New Student Orientation. New students who have been placed in Mathematics 25L or 31L on the basis of College Board SAT, Achievement, or Advanced Placement Examinations but who believe that their background in mathematics justifies a higher placement, should also confer during New Student Orientation with the supervisor of first-year instruction or with the director of undergraduate studies in the department of mathematics.

**Placement in Languages Other Than French, German, Spanish, and Latin.** Students who wish to continue in any language other than French, German, Spanish, or Latin should consult with the appropriate director of undergraduate studies. In the case of Russian, the department offers an examination which is used in conjunction with other criteria for placing students at the appropriate level.

**Reading Out of Introductory Courses.** Students demonstrating academic ability may be granted the option of reading out of an introductory or prerequisite course in order to allow them to advance at their own pace to upper-level work. No course credit may be earned by reading out. Reading for a course and auditing are mutually exclusive procedures. Students should consult with the appropriate directors of undergraduate studies who must approve the proposed program of reading. Students may be certified for advanced course work by passing a qualifying examination prepared by the department. When an advanced course is completed, an entry is made on the permanent record that the qualifying examination was passed, but no course credit is awarded.

## **Transfer of Work Elsewhere**

**Work Done Prior to Matriculation at Duke.** First-year Duke students may submit for evaluation college courses taken after the commencement of the student's junior year of high school. Students transferring from a degree program in another regionally accredited institution may be granted credit for up to seventeen semester-course credits. Students will not be awarded more than four semester-course credits for one semester's work unless they have satisfactorily completed more than the normal course load at the institutions from which they are transferring credit. Courses taken at other institutions prior to matriculation at Duke are evaluated by the university registrar and the faculty.



**Evaluation of Work Taken Elsewhere.** Courses in which grades of less than C- have been earned are not accepted for transfer credit; students seeking transfer credit for courses in which they earned a *P* grade must present official verification that the *P* is equivalent to at least a C- grade. The semester-course unit of credit awarded at Duke for satisfactorily completed courses cannot be directly equated with semester-hour or quarter-hour credits. Credit equivalency is determined by the university registrar. All courses approved for transfer are listed on the student's permanent record at Duke, but grades earned are not recorded. Further information is available from the university registrar.

College-level courses taken during the high school years are eligible for consideration for transfer of credit to Duke upon receipt of the following documentation: an official transcript of all college courses, sent directly from the college(s) attended to Duke; official notification by letter from the high school principal or guidance counselor that the credit earned was not used to meet high school diploma requirements; an official letter of verification from each college attended indicating that all courses were taken on the college campus, taken in competition with degree candidates of that college, taught by regular members of the college faculty, and were a part of the normal curriculum of the college. Course descriptions of all courses taken are required for evaluation. By policy, all precalculus and English composition courses taken during the high school years do not transfer to Duke.

After matriculation as a full-time degree candidate at Duke University, a student in Trinity College of Arts and Sciences may receive credit toward the Bachelor of Science or Bachelor of Arts degree for two courses taken in the domestic United States at another institution, whether in the summer while regularly enrolled at Duke, while withdrawn voluntarily from the college, or while on leave of absence for personal, medical, or financial reasons. Trinity College students, when eligible, may also receive transfer credit for up to ten courses taken in an approved program for study abroad (see the section on Study Abroad). In some cases, transfer credit may be received for a maximum of four of the final eight courses toward the bachelor's degree (see the section on Residence Requirements). Once matriculated, however, a student may not receive credit for more than a total of ten transfer courses toward the Bachelor of Science or Bachelor of Arts degree. Full-time degree candidates in the School of Engineering may receive credit toward the Bachelor of Science in Engineering degree for a maximum of four courses taken at another institution. No credit will be accepted for course work taken while a student is withdrawn involuntarily. For purposes of this regulation, advanced placement and interinstitutional credit (see the section on agreement with neighboring universities) are not considered as work taken at another institution.

Students may not transfer credit from two-year colleges after completing their sophomore year. At least half the courses submitted toward fulfillment of a student's major field must be taken at Duke, but departments may make exceptions to this rule in special circumstances. No credit is given for work completed by correspondence, and credit for not more than two semester courses is allowed for extension courses.

**Approval for Courses Taken Elsewhere.** Approval forms for Duke students taking courses at institutions other than Duke may be obtained from the offices of the academic deans. Students wishing to transfer credit for study at another accredited college while on leave or during the summer must present a catalog of that college to the appropriate dean and director of undergraduate studies and obtain their approval prior to taking the courses.

## Advising

Students and their advisors confer when necessary, but they should confer at least once before every registration period to review goals, plans for achieving them, and

any problems encountered or anticipated. Before declaring a major in Trinity College, students confer with the premajor advisor, the academic dean for premajor students, or the academic dean in the division of their interests. Upon declaring a major, the student is assigned a faculty advisor; the academic dean for that division is also available for consultation. In the School of Engineering, the advisor's approval is necessary for registration and all course changes. Much good advising is informal and occurs in conversation with members of the faculty. Students have the responsibility to understand and meet the requirements for the curriculum under which they are studying and should seek advice as appropriate.

## Registration

Students are expected to register at specified times for each successive term. Prior to registration each student receives special instructions and registration materials. Students prepare a course program, and submit it at an appointed time to their advisors for review. In the School of Engineering, the schedule must be approved by the advisor.

Students who expect to obtain certification to teach in secondary and elementary schools should consult an advisor in the education program prior to each registration period to ensure that they are meeting requirements for state certification and that they will have places reserved for them in the student teaching program.

Those who register late are subject to a \$50 late registration fee. In the case of students enrolled in Continuing Education, late fees are assessed after the first day of classes. Students who fail to register for the fall or spring semester are withdrawn and must apply for readmission if they wish to return; they also forfeit their registration deposits unless they indicate at the time of registration their intention not to continue in the university the following term. Those students who have not paid any fees owed to or fines imposed by the university (such as laboratory fees, library fines, and parking fines) by the date specified for registration for the following term will not be permitted to register for the following term until such fees and fines have been paid in full, notwithstanding the fact that the student may have paid in full the tuition for the following term.

Students planning to register for a course under the interinstitutional agreement must have the course approved by the appropriate director of undergraduate studies and their academic dean. Further information about registration procedures may be obtained from the Office of the University Registrar. See the chapter "Special Programs" for information regarding the reciprocal agreement with neighboring universities.

**Duke Identification Card and Term Enrollment.** Undergraduate students are issued identification cards which they should carry at all times. The card is a means of identification for library privileges, university functions, and services available to university students. Students are expected to present their card on request to any university official or employee. The card is not transferable, and fraudulent use may result in loss of student privileges or suspension. Loss of the card should be reported immediately to the Duke Card Office where new ones can be obtained for \$10. Official enrollment is required for admission to any class.

**Concurrent Enrollment.** A student enrolled at Duke may not enroll concurrently in any other school or college. See, however, the statement regarding the reciprocal agreement with the University of North Carolina at Chapel Hill, North Carolina Central University in Durham, and North Carolina State University at Raleigh.

**Course Changes after Classes Begin in the Fall and Spring Terms.** During the drop/add period changes may be made in course schedules. Students may drop and add courses during the first week of classes in the fall and spring terms at their own discretion; during the second week of the drop/add period they may drop courses at their own discretion, but the approval of the appropriate instructor is required for

adding a course. After the drop/add period no course may be added; also, a course may not be changed to or from the pass/fail or audit basis. To withdraw from a course, students must obtain permission from their academic deans; and for reasons of course overload, i.e., more than four semester courses, the academic dean may give permission prior to the last day of classes preceding the final four weeks of classes. The academic dean may also permit students with compelling reasons and in a normal course load to withdraw from a course prior to the last day of classes preceding the final four weeks of classes. After the drop/add period, students permitted to withdraw receive a *WP* grade (withdraw passing) or *WF* (withdraw failing) from the instructor. Course work discontinued without the dean's permission will result in a grade of *F*.

When students note an error in their course schedules, they should consult with their academic dean.

**Course Changes for the Summer Terms.** Course changes are accomplished through ACES, the telephone registration system. Duke students who are blocked from continuing into a summer term must see their academic dean.

Courses may be added before or during the first three days of the term. After the third day of the term, no course may be added. Prior to the first day of the term, students may drop a course or courses for which they have registered without penalty. During the first three days of the term, students will be charged \$150 per course (\$75 per half-course or per audited course) for dropping a course or courses if this results in any reduction in course load for the term. With the permission of the academic dean a course may be dropped until the end of the twentieth day of a regular summer term (eleventh day at the Marine Laboratory); the instructor then assigns a *WP* or *WF* grade. Course work discontinued without the approval of the dean will result in a grade of *F*. (See also the section on Withdrawal Charges and Refunds.)

## Course Load and Eligibility for Courses

Students are reminded that it is their responsibility to be certain that their course load conforms with academic requirements. The normal and expected course load in the fall or spring term is four semester courses. Students should take note that two additional semester credits are needed in order to meet the thirty-four (34) semester-course requirement for graduation. To take more than five semester courses, students must have the approval of their academic deans. No student, however, may take more than six courses in any semester. (Students matriculating prior to May 1997 should consult the bulletin of their matriculation year.)

Maximum course program for one term of the summer session is two courses, one of which may be a laboratory course. Students in the School of Engineering may enroll in two laboratory courses. In addition, a student may enroll in a physical education activity or technique/performance activity course for one-half course credit.

**Eligibility for Courses.** The rules established by the Graduate School provide that juniors and well-qualified sophomores may enroll in a 200-level (senior-graduate) course if they have obtained written consent of the instructor, as well as that of the director of graduate studies in the department concerned. Undergraduate students are normally not allowed to enroll in 300- or 400-level courses. Under exceptional circumstances, however, permission to do so may be granted, provided the instructor, the director of graduate studies, and the Dean of the Graduate School agree.

Seniors who, at the beginning of the final term, lack no more than three semester courses toward the fulfillment of the requirements for the Bachelor of Arts or Bachelor of Science degree may enroll in graduate courses, for a maximum course load of five semester courses. Admission to the Graduate School is necessary.



Students may not register for two courses meeting at the same time. In Trinity College no course may be repeated for credit or a grade if a C- or higher has been earned previously, except where noted in the course description. Physical education activity courses may be repeated, but without graduation credit. A course previously passed, however, may be audited.

Students who receive a D-, D, or D+ in any course in Trinity College are allowed to repeat the course at Duke. The grade earned in the repeated course as well as the grade earned originally appear on the transcript, the former identified as a repeat; both grades count in the grade point average, but the credit for only one counts toward the required number of courses for continuation and the thirty-four (34) courses required for graduation. Forms requesting to repeat a course are available in the offices of the academic deans.

## Course Audit

Students who audit a course submit no daily work and take no examinations. They do not receive credit for the course. With the written consent of the instructor, a full-time degree student is allowed to audit one or more courses in addition to the normal program. Physical education activity, studio art, applied music, and dance technique/performance courses may not be audited. In the fall or spring term, a part-time degree student may audit courses by payment for each course audited. In a summer term, a student carrying two courses for credit may be given permission to audit, without additional fees, nonlaboratory courses with the above exceptions. A student in a summer term carrying less than a full program for credit may secure permission to audit (above exceptions apply) but is required to pay half the university fee for the course. After the drop/add period in any term, no student classified as an auditor in a particular course may take the course for credit, and no student taking a course for credit may be reclassified as an auditor. A student may not repeat for credit any course previously audited.

Courses may be audited by faculty members, staff, alumni, employees and their spouses, as well as spouses of currently enrolled students, and members of the Institute for Learning in Retirement; courses audited on the Microelectronics Center of North Carolina (MCNC) Network may be audited without concurrent enrollment in another course. Formal application is not necessary; written permission from the instructor must be obtained and an approval form must be signed by the director of the Office of Continuing Education. Consult the chapter "Financial Information" for the appropriate fee schedule. Auditors must register on the Friday before classes begin.

## Independent Study

Independent study enables a student to pursue individual research and reading in a field of special interest, under the supervision of a member of the faculty, which results in a substantive paper or report containing significant analysis and interpretation of a previously approved topic. (That substantial paper or report is to be done in the semester in which the student is registered for the independent study course.) A student, with the approval of the instructor and the director of undergraduate studies in the instructor's department, may enroll in independent study for any term at Duke. In Trinity College, instructors of independent study courses are expected to meet with the students enrolled at least once every two weeks during the fall or spring and at least once each week during a summer term. Students are expected to complete a substantive paper for the course. Independent study courses do not count toward satisfying the area of knowledge requirements.



## Academic Internships

In Trinity College course credit can be earned for internships only when they include as a component an academic course of instruction. Academic internships must be offered under the auspices of an academic unit in Trinity College. Each student's internship must be sponsored by a departmental/program faculty member and approved by the director of undergraduate studies. Such internships typically draw upon work experience to investigate a research problem from one or more intellectual/disciplinary perspectives. They thus have an experiential component and a formal intellectual component leading to submission of a substantive research paper for evaluation. Academic internships are of two types: 1) academic internships that are required for an existing major and are required in programs designed to meet state teaching certification standards; 2) all other academic internships, which are considered to be electives. Only one course credit from these elective academic internships may count toward the thirty-four (34) course credits required for graduation. Further information about procedural requirements may be obtained from the academic deans.

## Submission of Term Paper

Students who wish (under unusual circumstances) to submit a single paper for credit in more than one course must receive prior written permission from each course instructor. The student must indicate the multiple submission on the title page of the paper.

## Declaration of Major or Division in Trinity College of Arts and Sciences

Before declaring a major in Trinity College, students work with their premajor advisors and with other members of the faculty and staff to develop a long-range academic plan which outlines progress and academic goals for the future. The plan should describe the proposed major program, related classroom and outside experiences, and the general pattern of elective courses, as well as the means by which the student will meet established college requirements for graduation. Although students may declare a major as early as the spring of the first undergraduate year, all students must secure formal approval of their long-range plans and must declare their majors before the last day of classes in their fourth undergraduate semester. Forms for filing the official long-range plan are available in the Premajor Advising Center and on the internet at <http://pmac-www.aas.duke.edu/lrp.html>.

After declaring a major, students are assigned an advisor in the department of the major and an academic dean in that division. Students who, having already declared a major, wish to change it should do so in the Office of the University Registrar.

A student may declare an interdepartmental major after receiving the approval of the directors of undergraduate studies of the departments involved; they or other advisors assist the student in preparing a program of course work. The major, which must be planned early in the undergraduate career, must consist of at least ten courses, including four courses at the 100 level or above in each of at least two or more Trinity College departments or programs that offer a major. One of them should be identified as primarily responsible for the student's advising. A copy of the plan for the program, with a descriptive title, should be presented, along with the written approval of the directors of undergraduate studies, to the appropriate academic dean. A student who declares an interdepartmental major must satisfy all other requirements for Program I.

A student who wishes to declare a second major should do so in the Office of the University Registrar before registering for the final term. If the student's second major is not offered within the degree to be granted for completion of the first major, a notation

of the second major will appear on the transcript. Majors offered within each degree are listed below:

*Bachelor of Arts.* African and African-American studies, art history, Asian and African languages and literature, biological anthropology and anatomy, biology, Canadian studies, chemistry, classical languages, classical studies, comparative area studies, computer science, cultural anthropology, drama, economics, English, environmental sciences and policy, French studies, geology, Germanic languages and literature, history, Italian and European studies, linguistics, literature, mathematics, medieval and Renaissance studies, music, philosophy, physics, political science, psychology, public policy studies, religion, Russian, sociology, Spanish, visual arts, and women's studies.

*Bachelor of Science.* Biological anthropology and anatomy, biology, chemistry, computer science, economics, geology, mathematics, physics, and psychology.

## **Class Attendance, Excused Absences, and Tests**

Responsibility for class attendance rests with the individual student, and since regular and punctual class attendance is expected, the student must accept the consequences of failure to attend. Instructors may refer to the student's academic dean a student who is, in their opinion, absent excessively. A student who has missed examinations or deadlines for assignments because of documented illness or authorized representation of the university off-campus may receive an official excuse or approved extension from the academic dean. Excuses are not issued for absences from class, discussion sessions, or laboratories, only for missed course work defined previously. Officials in charge of groups representing the university are required to submit the names of students to be excused to the appropriate deans' offices forty-eight hours before absences are to begin.

Class times are officially scheduled at registration unless designated "to be arranged" (TBA). No class time may be changed without prior permission of the University Schedule Committee. Within-class tests (except for the final) are to be given at the regular class meeting times. Exceptions are made for block tests that have been approved by the University Schedule Committee.

## **Incomplete Course Work**

If because of illness, emergency, or reasonable cause a student cannot complete work for a course, the student may request in writing to his or her academic dean the assignment of an *I* (incomplete) for the course. If the request is approved by the instructor in the course and by the student's academic dean, then the student must satisfactorily complete the work prior to the last class day of the fifth week of the subsequent semester (or earlier if there is a question of the student's continuation in school; see the section on quality of work in the chapter "Degree Programs"). Professors may also establish earlier deadlines. An *I* assigned in the fall or spring semester must be resolved in the succeeding fall or spring term, respectively. If the *I* is not completed by the deadline, it will convert to an *F* grade. Once recorded, the *I* will remain permanently on the student's record, even after the final grade is assigned for the course. In addition, an *I* cancels eligibility for Dean's List and Dean's List with Distinction. If a student whose work is incomplete is also absent from the final examination, an *X* is assigned for the course (see below). A student not enrolled in the university during the semester following receipt of an *I* or *X* will have until the end of the fifth week of classes of the next semester (fall or spring) of matriculation to clear the *I*. Students may not complete work in a course after graduation.

## Final Examinations and Excused Absences

The times and places of final examinations for the fall and spring terms are officially scheduled by the University Schedule Committee, generally according to the day and hour of the regular course meeting; changes may not be made in the schedule without the approval of the committee. If a final examination is to be given in a course, it will be given at the officially scheduled time. Take-home examinations are due at the regularly scheduled hour of an examination, based on the time period of the class. In fall or spring courses where final examinations are not scheduled, examinations may not be given in the last week of classes. In the summer session, final examinations are held on the last two days of each term as specified in the summer session brochure calendar. Final examinations for short courses are held on the last day of the course.

No later than the end of the first week of classes of the fall and spring term, the instructor is required to announce plans for the final examination exercise. Unless departmental policy stipulates otherwise, the form of the final exercise is determined by the instructor. However, a final written examination may not exceed three hours in length and a final take-home examination may not require more than three hours in the actual writing.

If a student is absent from a final examination, an *X* is given instead of a final grade unless the student's grade in the class is failing, in which case the instructor may submit an *F*. The student must present an acceptable explanation for the absence to the appropriate academic dean within forty-eight hours after the scheduled time of the examination. Deferral of a final examination will not be authorized by the academic dean if it is ascertained that the student has a history of excessive absences or failure to complete course work in a timely fashion in the course in question. The *X* is converted to an *F* if the academic dean does not approve the absence. If the absence is excused by an academic dean, the student arranges with the dean and the instructor for a make-up examination to be given at the earliest possible time. It should be noted that uncleared grades of *X* may have significant ramifications regarding continuation in the university. (See Grading and Grade Requirements below.) An excused *X* not cleared by the end of the fifth week of the following semester is converted to an *F*. A student not enrolled in the university during that following semester has until the end of the fifth week of the next semester of enrollment to clear the *X* unless an earlier deadline has been established by the instructor and the academic dean.

## Grading and Grade Requirements

Final grades on academic work are sent to students after the examinations at the end of each term. Midterm advisory grade reports for freshmen are issued in the fall and spring.

**Passing Grades.** Passing grades are *A*, exceptional; *B*, superior; *C*, satisfactory; *P*, passing (see pass/fail option below); and *D*, low pass. These grades may be modified by a plus or minus. A *Z* may be assigned for the satisfactory completion of the first term of a two-course sequence, and the final grade for both courses is assigned at the end of the second course of the sequence.

Although the *D* grade represents low pass, in Trinity College not more than two courses passed with *D* grades may be counted among those required for year-to-year continuation or among the thirty-four courses required for graduation. Courses for which a *D* grade is earned, however, satisfy other requirements. For information on repeating a course with a *D* grade, see the section on course load and eligibility for courses in this chapter.

**Failing Grades.** A grade of *F* or *U* (see pass/fail option below) indicates that the student has failed the course. The grade is recorded on the student's record. If the



student registers for the course again, a second entry of the course and the new grade earned are made on the record, but the first entry is not removed.

**Pass/Fail Option.** With the consent of the instructor and faculty advisor, a student who has declared a major may register for grading on a pass/fail basis in one elective course each semester and summer session. (Details for registering for courses on a pass/fail basis are included in the ACES registration booklet.) Courses in the major, the minor, and certificate programs cannot be taken pass/fail. Additionally, no other degree requirements, except the requirement for thirty-four course credits and the continuation requirements, may be met by a course passed under the pass/fail option, unless the course is offered only on that basis. Preceptorial, discussion sections, seminars, and tutorials may not be taken on the pass/fail basis, unless the course is offered only on that basis.

After the drop/add period in any term, no changes from pass/fail to regular status, or from regular to pass/fail status, are permitted in any course. A *P* may not be converted subsequently to a regular letter grade, and the course may not be retaken under the regular grading system.

**Grades When Absent from Final Examination.** See the section on final examinations and excused absences in this chapter.

**Effects of Incomplete Work.** For purposes of determining satisfactory progress each term and toward graduation, incomplete work in a course indicated by a grade of *I* or *X* is considered a failure to achieve satisfactory performance in that course. Furthermore, an incomplete during the academic year cancels eligibility for semester honors; i.e., Dean's List and Dean's List with Distinction. See the section on incomplete work in this chapter.

**WP, WF, and W Grades, and WE Designation.** *WP* and *WF* grades may be issued if a student withdraws from a course after the drop/add period. (See the sections on course changes in this chapter.) *W* grades are issued if a student withdraws from the university before the last four weeks of regular classes in the fall or spring semester, or before the last two weeks of classes in a regular summer term. (See the section on withdrawal and readmission in this chapter.)

*WE* indicates correction of an error in registration. It is not a grade.

## Continuation

Students must achieve a satisfactory record of academic performance each term and make satisfactory progress toward graduation each year to continue in the college. Students who fail to meet the minimum requirements to continue must leave the college for at least two semesters. (A summer session may be counted as a semester.) Those desiring to return after the dismissal period may apply to Trinity College of Arts and Sciences for readmission. If, after readmission, the student fails again to meet minimum requirements, the student will be ineligible, except in extraordinary instances, for readmission to the college. Students admitted to degree programs from Continuing Education should consult their academic deans concerning continuation.

**Satisfactory Performance Each Term (Semester Continuation Requirements).** A student who does not receive a passing grade in all courses must meet the following minimum requirements or be withdrawn from the college.

*In the Fall or Spring Semester:* (1) in the first semester of enrollment at Duke, a student must pass at least two semester courses; (2) after the first semester at Duke, a student must pass at least three semester courses; (3) a student taking an authorized underload after the first semester at Duke must earn all passing grades. Students may not carry an underload without the permission of their academic dean. For the purposes of continuation, incomplete work in any course is considered a failure to achieve



satisfactory performance in that course. Therefore, where continuation is in question, incomplete work in any course must be completed with a passing grade in time for final grades to be submitted to the Office of the University Registrar no later than the weekday preceding the first day of classes of the spring semester, or prior to the first day of classes of the second term of the summer session, as appropriate. In the case of incomplete work in the spring semester, this requirement applies whether or not the student plans to attend one or more terms of the summer session. The student, however, may not enroll in a summer term at Duke unless the requirement of satisfactory performance each semester has been satisfied.

*In the Summer Session:* to maintain enrollment at Duke a student may not fail more than one full course in a summer term or a summer session. For purposes of continuation, incomplete work is considered failure to achieve a satisfactory performance in that course. Therefore, when eligibility to continue from the summer session to the fall is in question, incomplete courses must be satisfactorily completed in time for a passing grade to be submitted to the Office of the University Registrar no later than the weekday preceding the first day of fall classes. Moreover, no student may enter the fall semester with more than one incomplete grade from the preceding spring and summer.

Any student excluded from the college under the provisions of these regulations may on request have the case reviewed by the senior associate dean of Trinity College of Arts and Sciences.

**Satisfactory Progress toward Graduation (Annual Continuation Requirements).** Each year prior to the beginning of fall term classes, a student must have made satisfactory progress toward fulfillment of curricular requirements to be eligible to continue in the college; i.e., a certain number of courses must have been passed at Duke according to the following schedule:

**To be eligible to continue to the**

2nd semester at Duke  
3rd semester at Duke  
4th semester at Duke  
5th semester at Duke  
6th semester at Duke  
7th semester at Duke  
8th semester at Duke

**A student must have passed**

2 semester courses at Duke  
6 semester courses at Duke  
10 semester courses at Duke  
14 semester courses at Duke  
19 semester courses at Duke  
22 semester courses at Duke, plus two additional courses\*  
26 semester courses at Duke, plus two additional courses\*

For students who have interrupted their university studies, the continuation requirement must still be satisfied before the beginning of each fall term. For such students, the number of courses needed to satisfy the continuation requirement is determined from the table above, based on which semester they will enter in the fall term.

Courses taken in the summer term at Duke may be used to meet this requirement; except as noted,\* advanced placement may not be used to satisfy it. No more than two courses completed with *D* grades may be counted toward fulfilling this annual continuation requirement.

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\*The additional semester courses may be earned through advanced placement and/or transferred courses.

## Academic Warning and Probation

A student whose academic performance satisfies continuation requirements (see above), but whose record indicates marginal scholarship will be subject either to

academic warning or academic probation. Failure to clear probationary status in the semester of probation will result in a student's dismissal for academic reasons. (See the section "Continuation" for information concerning dismissal.) Students admitted to degree programs from Continuing Education should consult their academic deans concerning warning and probation.

**Academic Warning.** A student who receives a single grade of *F* or any *D* beyond one will be issued an academic warning by the academic dean.

**Academic Probation.** For a student enrolled in a normal course load (of at least four semester courses), the following grades will result in academic probation for the succeeding semester: during the first semester of the freshman year, grades including *DD*, *DF*, or *FF*; during any subsequent semester, grades including *DDD* or *DF*; and during two consecutive semesters, grades including *DDDD*, *DDDF*, or *DDFF*. For a student enrolled in an authorized underload (i.e., fewer than four course credits), the following academic performance will result in academic probation: during the first semester of the freshman year, grades of *DD* or *DF*; during any subsequent semester, grades including *DDD* or *DF*; and during two consecutive semesters, grades including *DDDD*, *DDDF*, or *DDFF*.

The probation status will be reflected on those academic records used for internal purposes only. Students placed on academic probation must acknowledge their probationary status in writing to their academic dean in order to continue in the college. They are also expected to seek assistance from campus resources, have their course selection approved by their academic deans and meet periodically with them. Students are expected to clear their probationary status during the semester of probation. In order to do so, they must enroll in four full-credit courses, of which no more than one may be taken on a pass/fail basis. Grades of *C-*, *P*, or better must be earned in each course, or a *C* average must be achieved in that semester.

Probationary status cannot be cleared in a semester in which students seek permission and are allowed to withdraw to an underload. In such cases, the probationary status continues through the next semester of enrollment or in both terms of the summer session. Students on probation, whether in a normal load or an underload, are required to meet continuation requirements. Students whose probationary status for reason of an underload continues to a second semester must adhere to the conditions and standards previously outlined for clearing probation. Failure to do so will result in academic dismissal.

## Changes in Status

**Withdrawal and Readmission.** Students who wish to withdraw from the college must give official notification to their academic dean. Notification must be received prior to the beginning of classes in any term or tuition will be due on a pro rata basis. (See the section on refunds in the chapter "Financial Information.") For students withdrawing on their own initiative after the beginning of classes and prior to the last four weeks of regular classes in the fall or spring term, or before the last two weeks of regular classes in a summer term, a *W* is assigned in lieu of a regular grade for each course. After these dates an *F* grade is recorded unless withdrawal is caused by an emergency beyond the control of the student, in which case a *W* is assigned by the student's academic dean.

Students may be involuntarily withdrawn for academic reasons, financial reasons, and violation of academic regulations. The expectations pertaining to each are found in the chapters "Degree Programs," "Financial Information," and this chapter, "Academic Procedures and Information."

Applications for readmission are made to the appropriate school or college. Each application is reviewed by officers of the school or college to which the student applies, and a decision is made on the basis of the applicant's previous record at Duke, evidence of increasing maturity and discipline, and the degree of success attendant upon activities

during the time away from Duke. Students who are readmitted usually cannot be housed on campus.

Applications for readmission must be completed by November 1 for enrollment in the spring, by April 1 for enrollment in the summer, and by July 1 for enrollment in the fall.

**Leave of Absence.** An upperclassman in good standing may apply in writing to the appropriate academic dean to take a leave of absence for one or two semesters; the deadline for application for a leave is the end of the registration period for the semester immediately preceding the leave. Students returning from approved medical, financial, personal, or study abroad leaves and desiring housing on campus will be placed in the general housing lottery, provided they have submitted the appropriate information to the Office of Residential Life by their published deadline noted above and provided that they lived on campus before taking their approved leave. Unless an exception for an emergency is authorized by the students' academic deans, students applying after the course registration cited above will lose their priorities in university housing for the period following the leave.

Registration materials will be mailed to a student on leave, but final registration is, of course, contingent upon the student's fulfilling the terms of the leave. A student failing to register while on leave will be withdrawn from the university and will have to apply for readmission.

A student who undertakes independent study under Duke supervision and for Duke credit is not on leave of absence even if studying elsewhere. The student registers at Duke as a nonresident student and pays the appropriate fees or tuition at Duke. This also applies to Duke programs conducted away from the Durham campus.

**Transfer between Duke University Schools.** Students in good standing may be considered for transfer from one Duke undergraduate school or college to another, upon written application and request for a letter of recommendation from their academic dean. The review of requests to transfer involves consideration of a student's general academic standing, citizenship records, and relative standing in the group of students applying for transfer. The school or college to which transfer is sought will give academic counseling to a student as soon as intention to apply for transfer is known, although no commitment will be implied. A student may apply to transfer at any time prior to receiving a baccalaureate degree. A student transferring to Trinity College of Arts and Sciences from the School of Engineering, prior to receiving a baccalaureate degree, may not use more than six professional school credits toward the Bachelor of Arts or Bachelor of Science degree. If admitted after having earned a baccalaureate degree, a student must complete in Trinity College a total of seventeen additional courses. Transfer credit, AP credit, or courses previously used to satisfy requirements for the degree in engineering cannot be counted.

**Full-Time and Part-Time Degree Status.** Candidates for degrees are expected to enroll in a normal course load (i.e., at least four semester courses) each semester. Students matriculating before May 1997 should consult the bulletin of the year they matriculated for information and guidelines concerning part-time status. (Part-time students may register for not more than two courses (or two courses and a half-credit physical education activity) and may not live in university housing.) Degree candidates who matriculated through Continuing Education or are employees should confer with their academic deans about course load requirements.

**Resident and Nonresident status.** See the chapter "Campus Life and Activities."



**Nondegree to Degree Status.** A nondegree student must apply to the Office of Undergraduate Admissions for admission to degree candidacy.

## The Provision of Academic Information to Parents and Guardians

Duke University complies with the policies set forth in the Family Educational Rights and Privacy act of 1974 concerning confidentiality, privacy, and release of information as they pertain to students' educational records. It is primarily the responsibility of students to keep parents and guardians informed of their academic standing and progress as well as any difficulties which may affect their performance. The Office of the Registrar sends grade reports to students at the end of each term and midterm reports to first-year students and their parents or guardians. Additionally, other available information is provided routinely to parents and guardians of undergraduates by the Office of the Dean. They are sent copies of correspondence to students notifying them of changes in their academic standing or regarding unsatisfactory performance which may lead to academic dismissal or the necessity of attending summer school. Parents and guardians may also be alerted to emergency and extraordinary situations which may impinge upon a student's well being.

## Academic Recognition and Honors

In determining a student's eligibility for academic recognition and honors, only grades earned in Duke courses, including those earned in Duke Study Abroad programs and in courses covered by the interinstitutional agreement (see index) are considered.

**Dean's List** accords recognition to academic excellence achieved during each semester. To be eligible for this honor, undergraduates must earn a grade point average placing them in the highest one third of their class and in addition must: (1) carry a normal academic load; 2) earn grades other than *P* in at least three semester courses; and 3) receive no incomplete or failing grades. Undergraduates who in addition earn grade point averages that place them in the highest ten percent of their class will receive the Dean's List with Distinction honor, while the remainder of those placing in the highest one third of their class will receive the Dean's List honor as noted above.

**Graduation with Distinction** accords recognition to students who achieve excellence in their major area of study as determined by the departments and as approved by the Committee on Honors of the Arts and Sciences Council. All academic units offering a major have procedures for granting graduation with distinction, as does Program II. This recognition is separate and distinct from Latin Honors which is concerned with overall academic excellence (see below). Interested students should consult the relevant directors of undergraduate study or Program II dean responsible for specific requirements of and eligibility for graduation with distinction. In general, majors with departments and programs seeking to graduate with distinction will participate during their junior and/or senior years in a seminar and/or a directed course of reading, laboratory research, or independent study which results in substantive written work. The students' overall achievement in the major or in Program II, including the written work, is assessed by a faculty committee. In Program II this committee is established by the directors of undergraduate study in the units concerned. Graduation with distinction may be awarded according to three levels: highest distinction, high distinction, distinction.

**Latin Honors By Overall Academic Achievement** accord recognition for overall academic excellence achieved across an entire undergraduate career.

Unlike the Dean's List honor which recognizes overall academic excellence achieved over the short term, eligibility for the three categories of Latin Honors (summa



cum laude, magna cum laude, and cum laude) is based on the student's cumulative grade point average. Recipients are determined by the following procedure: The grade point average included within the highest five percent of the previous year's graduating class is used to specify the grade point average needed by those students of the current graduating class to be awarded the summa cum laude honor. The grade point average included within the next highest ten percent of the previous year's graduating class is used to determine the grade point average needed by those students who will graduate with the magna cum laude honor. Finally, the grade point average included within the next ten percent of the previous year's graduating class will be used to determine those students eligible for graduating with the cum laude honor. Thus, twenty-five percent of each graduating class will receive some form of Latin Honors.

## OTHER HONORS

**Phi Eta Sigma.** Elections to the national freshman honorary society, Phi Eta Sigma, are made at the end of the fall and spring semesters. Students who earn a 3.5 average in four or more semester courses in their first semester of enrollment, or those whose cumulative average at the end of their second semester is 3.5 or above in a program of eight or more semester courses, are invited to membership.

**Phi Beta Kappa.** Phi Beta Kappa, the national academic honor society founded at William and Mary on December 5, 1776, elects undergraduate students in Trinity College and the School of Engineering each fall and spring. Eligibility for election is determined not by the university but by the bylaws of the local chapter (Beta of North Carolina) on the basis of outstanding academic achievement and high moral character. Reviews of the academic record of all prospective candidates are conducted in the junior and senior years. The academic record must not contain an unresolved incomplete (I). For early election, students must have completed at least eighteen but fewer than twenty-four graded courses taken at Duke. Regular election requires at least twenty-four graded courses taken at Duke. Transfer students and other students who do not qualify under the preceding requirements may be eligible for deferred election; such students must also have achieved a superior academic record in graded courses at Duke, especially over the last sixteen courses. The total number of persons elected annually is limited by chapter bylaw to 10 percent of the graduating class, of whom no more than one percent can be selected by early election. Eligibility requires a course of study with the breadth that characterizes a liberal education. The Program I curriculum meets those expectations; Program II and Engineering students must demonstrate comparable breadth in order to be eligible. Inquiries concerning distribution requirements for students in the School of Engineering should be directed to Professor Rhett George, Department of Electrical Engineering. All other inquiries may be directed to the Secretary of Phi Beta Kappa, Box 99352, Duke Station, Durham, North Carolina 27708.

**Golden Key.** Membership to the national academic honors organization, the Golden Key National Honor Society, is by invitation to the top 15 percent of university juniors and seniors in all fields of study. Chapter activities are service and interaction oriented. All members are encouraged to become active participants. Scholarships are awarded annually. A national network for career assistance is available to members. Inquiries may be directed to Dr. Caroline Lattimore, Duke chapter advisor, Box 90739, Duke University, Durham, NC 27708.

**Tau Beta Phi.** Elections to the national engineering honor society, Tau Beta Pi, are held in the fall and spring. Eligibility is determined on the basis of distinguished scholarship and exemplary character. Engineering students whose academic standing is in the upper eighth of the junior class or the upper fifth of the senior class have earned consideration by their local chapter. Inquiries may be directed to the Advisory Board,

Tau Beta Pi, School of Engineering, Box 90271, Duke University, Durham, North Carolina 27708.

**International Postgraduate Scholarships.** Students interested in various prestigious fellowships for graduate study (for example, the Fulbright, Luce, Marshall, Rhodes, and Winston Churchill) should consult the academic dean in charge of fellowships, 04 Allen Building. Specific information about deadlines and procedures is available through that office.

## Notification of Intention to Graduate

The Diploma Card for students in Trinity College of Arts and Sciences and the School of Engineering is official notification that they expect to have completed all requirements for the degree and to receive the diploma on a particular graduation date. It is the responsibility of students to file the card on or before established deadlines. For students in Trinity College, the cards, to be filed during the fall registration period, are available in the college recorder's office; in the School of Engineering, the dean's office.

## Commencement

Graduation exercises are held once a year in May when degrees are conferred upon and diplomas are issued to those who have completed degree requirements by the end of the spring term. Those who complete the requirements by the end of the summer term or by the end of the fall term receive diplomas dated September 1 or December 30, respectively. There is a delay of one month to two months in the mailing of September and December diplomas because diplomas cannot be issued until they are approved by the Academic Council and the Board of Trustees.

## Prizes and Awards

The achievements of undergraduate students are recognized in various fields of activity. The following prizes suggest the range of recognition. According to current university policy, some of the scholarships listed must be awarded in honorary form unless the students chosen are on financial aid, in which case the scholarships will be incorporated in the winners' financial packages. These scholarships are identified by an asterisk (\*).

### HUMANITIES

**The Edward H. Benenson Awards in the Arts.** These awards of \$300 to \$3,000 are granted annually through the generosity of Duke alumnus and trustee Edward H. Benenson. Funds are awarded for fees, equipment, supplies, travel, production, and other educational expenses for projects in art, music, drama, dance, creative writing, and film/video proposed by undergraduates and graduating seniors of Trinity College and the School of Engineering. Application forms and instructions are available in February from the Institute of the Arts, 109 Bivins Building.

**The Louis Sudler Prize in the Arts.** An award is presented annually by the Institute of the Arts to a graduating senior who, in the opinion of a special institute committee, has demonstrated the most outstanding achievement in artistic performance or creation. The prize of \$1,000 was established in 1983 through the generosity of Louis C. Sudler, Chicago, Illinois.

**The David Taggart Clark Prize in Classical Studies.** This prize derives from income earned on the generous bequest (1956) of Professor David Taggart Clark, classicist and economist. It is awarded to the senior major in classical studies or classical languages who is judged to have written the best honors essay of the year, and consists of an important book or books in the field of classics.

**John M. Clum Distinguished Drama Graduate Award.** This award is named for the distinguished founder of the Duke University Drama Program. The award recognizes an outstanding graduating senior who has made extraordinary contributions to the life of the program, and who has exhibited outstanding personal and professional qualities.

**The Reynolds Price Award for Script-writing.** This award is presented annually by the Drama Program to a Duke undergraduate for the best original script for stage, screen, or television.

**The Augusto Lentricchia Award for Excellence in Directing.** A prize of \$250 is awarded annually to an undergraduate of Duke University for sustained excellence in directing for the stage or screen. The award is sponsored by the Drama Program through a continuing gift from Frank Lentricchia, who named the award in memory of his paternal grandfather, a man of few, but penetrating words, and a keenly observant and extraordinarily disciplined poet.

**The Tommaso Iacovella Award for Excellence in Acting.** A prize of \$250 is awarded annually to an undergraduate of Duke University for sustained excellence in acting for the stage or screen. The award is sponsored by the Drama Program through a continuing gift from Frank Lentricchia, who named the prize in memory of his maternal grandfather, a captivating and exuberant storyteller who inspired him with his charismatic and surprising stories.

**Dasha Epstein Award in Playwriting.** This award is made to a current third-year Duke student with demonstrated promise in playwriting. It covers the costs of the student's attending the two-week National Playwrights Conference held each summer at the Eugene O'Neill Theater Center in Waterford, Connecticut.

**The Robert J. Niess/Alexander Hull Award in French.** Given each year to an outstanding French major in honor of Robert J. Niess, professor of French at Duke University from 1972 to 1981 and Alexander Hull, associate professor of French at Duke University from 1962 to 1993.

**The Bascom Headen Palmer Literary Prize.** This prize was established in honor of Bascom Headen Palmer's achievement as recipient of the Hesperian Literary Society Medal in 1875, his senior year in Trinity College. It recognizes the best senior honors thesis in literary study each year.

**The Henry Schuman Music Prize.** A prize of \$350 is awarded annually to an undergraduate of Duke University for an original composition or a distinguished paper in music history or analysis. The award is sponsored by the Department of Music through a continuing gift from Dr. and Mrs. James H. Semans, who named the prize after Henry Schuman, a lifelong friend of the Semans and Trent families, a talented amateur violinist, and one who helped to build valued collections in the Duke library.

**Giorgio Ciompi Scholarships.** Named for the founder of the Ciompi String Quartet, Duke University's quartet in residence, these music scholarships are given to students who can demonstrate talent and achievement on a string instrument. Although recipients need not major in music, they are required to study privately. These scholarships cover fees for applied instruction.

**The Smith Memorial Scholarship.** This scholarship of up to \$2,000, in memory of Marvin Boren and Elvira Lowe Smith, is awarded to an organist who is an undergraduate music major or a graduate student in performance practice. It is renewable as long as the recipient continues to study the organ and maintains satisfactory progress.

**Keyboard Classics Magazine Scholarship.** This music scholarship of \$1,000 is awarded on the basis of merit to an entering pianist. It is renewable annually as long as the recipient is registered for applied piano study and is making satisfactory progress.

**The Larry and Violet H. Turner Scholarship.** Established by a gift of Larry Turner, class of 1935, the scholarship is given to an undergraduate demonstrating outstanding ability on a string instrument. Although recipients need not major in music, they are required to study privately. The scholarship covers fees for private instruction.

**Sheet Music Magazine Scholarships.** Two music scholarships of \$750 each are offered annually to entering first-year instrumentalists on a competitive basis. Enrollment in applied music (in the principal instrument) and participation in a departmental ensemble are required. The awards are renewable for up to four years as long as these requirements are met and progress is satisfactory.

**The Julia Wilkinson Mueller Prize for Excellence in Music.** An award of \$300 will be presented to a graduating senior for achievement in musical performance.

**The Richard L. Predmore Award in Spanish.** Given each year to an outstanding Spanish major in honor of Richard L. Predmore, professor of Spanish at Duke University from 1950-1978 and dean of the Graduate School from 1962-1969.

**\*The William M. Blackburn Scholarship.** This fund was established in 1962 to honor William Blackburn, distinguished teacher of writing at Duke. The scholarship, awarded by the Department of English, recognizes outstanding achievement in the field of creative writing.

**The Anne Flexner Memorial Award for Creative Writing.** This award was established by the family and friends of Anne Flexner, who graduated from Duke in 1945. Open to all Duke undergraduates, the competition for prose fiction (5,000-word limit) and poetry (200-line limit) is sponsored in the spring semester by the Department of English. Entries are judged by the department's Committee on Creative Writing; awards range from \$200 to \$500.

**The Rudolph William Rosati Fund.** Established in 1978 by Mr. W. M. Upchurch, Jr., this fund honors the memory of his friend, the late Mr. Rosati, a talented writer. Awards are given to encourage, advance, and reward creative writing among undergraduate students. A committee named by the provost oversees the program and distribution of the fund.



\***The Margaret Rose Knight Sanford Scholarship.** This fund was established in recognition of the untiring efforts of Margaret Rose Knight Sanford on behalf of Duke University. The scholarship is awarded to a female student who demonstrates particular promise in creative writing. Awards are made by the Department of English.

\***The Francis Pemberton Scholarship.** This award was created by the trustees of the Mary Duke Biddle Foundation in memory and in honor of Francis Pemberton's service to the Biddle Foundation. The scholarship is awarded by the Department of English to a junior or senior pursuing the study of creative writing.

\***The E. Blake Byrne Scholarship.** This fund was created in 1986 by E. Blake Byrne (Trinity College, Class of 1957). The award is made by the Department of English to rising juniors with demonstrated talent in creative writing.

## SOCIAL SCIENCES

**The Winfred Quinton Holton Prize in Primary Education.** This prize was established in 1922 by gifts of Holland Holton, Class of 1907, and Lela Young Holton, Class of 1907, in memory of their son, Winfred Quinton Holton, with the income to be used to provide a prize for investigative work in primary education. This prize may be made annually. Competition is open to Duke seniors and graduate students who are eligible to obtain certification to teach. A student who wishes to be considered for the prize must submit a paper to be judged by a faculty committee in the Program in Education.

**The William T. Laprade Prize in History.** This prize is offered in honor of William T. Laprade, who was a member of the Department of History at Trinity College and Duke University from 1909 to 1953, and chairman of the department from 1938 to 1952. It is awarded to a senior who is being graduated with distinction and whose senior essay in history has been judged to be unusually meritorious.

### Robert S. Rankin Political Science Awards

**Award in American Government and Constitutional Law.** An award to the outstanding student in the field of American government and constitutional law. A prize of at least \$150 is donated by a former student of Professor Rankin's, Judge Jerry B. Stone, A.B. '44, J.D. '48.

**Award in American National, State, and Local Governments.** An award to the outstanding student in the field of American national and/or state and/or local governments. A prize of at least \$100 is also donated by Judge Stone.

**American Government Award for Leadership and Academic Achievement.** One or more awards have been donated by Robert H. Connery, Professor Emeritus of Public Law and Government at Columbia University, and from 1949-65 a colleague of Professor Rankin's when both were members of the Duke faculty, and by a group of Professor Rankin's former students. These awards are given to students, chosen by the Department of Political Science, who have demonstrated excellence in the study of American government and whose past achievements and future promise manifests not only high intellectual attainments, but also an exemplary leadership role in service to Duke University or to the community as broadly defined.

**Alona E. Evans Prize in International Law.** An annual award to an undergraduate and/or graduate student in arts and sciences whose paper(s) on international law reflect(s) excellence in scholarship. Substantial money prizes are derived from income earned on the generous bequest of Professor Alona E. Evans, A.B. '40, Ph.D. (political science) '45.

**Elizabeth G. Verville Award.** An annual award to the undergraduate who submits the best paper in the subject matter of political science. Funds for the award of \$100 are derived from a gift by Elizabeth G. Verville, a political science major, A.B. '61.

**The Marguerite (Mimi) Voorhees Kraemer Award.** This annual award was created by the family and friends of Mimi Voorhees, a public policy studies major, class of 1979. It recognizes a PPS student who has demonstrated strong leadership qualities and a commitment to public service. This award is given to a junior as a scholarship to help defray the costs of participating in the summer internship program.

**The Joel Fleishman Distinguished Scholar Award.** This award is presented annually by the Sanford Institute of Public Policy, recognizing the graduating major with the highest academic achievement in public policy.

**The Terry Sanford Departmental Award.** This award is presented annually by the Sanford Institute of Public Policy to the graduating major recognizing his/her achievement in leadership.

**The Karl E. Zener Award for Outstanding Performance of a Major in Psychology.** The Karl E. Zener Award is given to psychology majors who have shown outstanding performance and scholarship. The award, based on the student's total grade record and a paper submitted to the award committee, consists of a monetary prize and inclusion by name on a memorial plaque in Zener Auditorium.

## NATURAL SCIENCES AND MATHEMATICS

**The Edward C. Horn Memorial Prize for Excellence in Biology.** Given each year to a graduating biology major who has shown, in the opinion of the biology faculty, the highest level of academic



achievement and promise, this prize is offered in memory of Professor Edward C. Horn. It is a tribute to his warm regard for students and faculty and his appreciation of scholarly excellence. The prize consists of books appropriate to the student's field of interest.

**CRC Outstanding Freshman Chemistry Award.** A copy of the *Chemical Rubber Company's Handbook of Chemistry and Physics* is awarded annually to a freshman student in chemistry. The basis for selection by a faculty committee is academic excellence.

**American Chemical Society Undergraduate Award in Analytical Chemistry.** This prize is given annually by the Analytical Division of the American Chemical Society to an undergraduate student in analytical chemistry. The basis for selection is academic excellence and laboratory proficiency. The prize is a subscription to the journal *Analytical Chemistry* published by the American Chemical Society.

**North Carolina Institute of Chemists Award.** This prize is awarded annually to a graduating senior who has demonstrated a record of leadership and scholastic achievement and who has shown potential for advancement of the chemical and chemical engineering profession.

**The Chemistry Department Award.** This prize is awarded annually to an outstanding senior chemistry major in the Bachelor of Science degree program. The basis for selection is the student's independent research and interest in pursuing advanced work in chemistry. The award is a one-year membership in the American Chemical Society and a one-year subscription to an appropriate journal.

**The Merck Index Award.** This prize is awarded annually to one or more graduating chemistry majors intending to pursue a career in medicine. Selection, by a faculty committee, is based on scholastic excellence. The prize consists of a copy of the Merck Index presented by Merck and Co., Inc.

**The Hypercube Scholar Award.** This prize is awarded annually to an outstanding senior chemistry major in the bachelor of science program. Selection, by a faculty committee, is based on the student's scholastic achievement, performance in independent study, and interest in pursuing advanced work in a field of chemistry which utilizes molecular modeling extensively. The prize consists of a molecular modeling computer software package presented by *Hypercube, Inc.*

**The James B. Rast Memorial Award in Comparative Anatomy.** The parents and friends of James Brailsford Rast, a member of the Class of 1958 of Duke University, endowed this award in his memory. The award, consisting of the *Atlas of Descriptive Human Anatomy* by Sobotta and bearing the James B. Rast Memorial bookplate, is given annually to the student who demonstrates the greatest achievement in the study of comparative anatomy.

**Julia Dale Prize in Mathematics.** This award was established in 1938 by friends and relatives of Julia Dale, an assistant professor of mathematics at Duke University who died early in her career. The annual cash award is given through the Department of Mathematics to one or more undergraduate students in recognition of excellence in mathematics.

**Karl Menger Award.** This award was established in 1989 by relatives of distinguished twentieth-century mathematician Karl Menger. The annual cash award is given through the Department of Mathematics in recognition of outstanding performance in mathematical competitions.

**Thomas V. Laska Memorial Award.** Awarded annually by the Division of Earth and Ocean Sciences to a graduating senior in recognition of most outstanding achievement and promise for future success in the earth sciences. The recipient receives a gift and his/her name is engraved, with those of past recipients, on a granite tablet located in the divisional office. The award is sponsored by Andrew J. and Vera Laska in memory of their son, Thomas Vaclav Laska.

**Estwing Award.** Awarded annually to a graduating senior by the Division of Earth and Ocean Sciences in recognition of outstanding achievement in the earth sciences.

## ENGINEERING

**The Walter J. Seeley Scholastic Award.** This award is presented annually by the Engineers' Student Government to that member of the graduating class of the school who has achieved the highest scholastic average in all subjects, and who has shown diligence in pursuit of an engineering education. The award was initiated to honor the spirit of academic excellence and professional diligence demonstrated by the late Dean Emeritus Walter J. Seeley. It is hoped that this award will serve as a symbol of the man and the ideals for which he stood. The name of the recipient is inscribed on a plaque displayed in the Engineering Building.

**The American Society of Civil Engineers Prize.** The prize is awarded annually by the North Carolina Chapter of the American Society of Civil Engineers to two outstanding civil engineering seniors, upon recommendation of the faculty of the civil engineering department. The basis for selection is the student's scholastic record, contribution to the student chapter, and participation in other college activities and organizations. The prize consists of a certificate of award and the payment of one year's dues in the American Society of Civil Engineers.

**The George Sherrerd III Memorial Award in Electrical Engineering.** This award is presented annually to the senior in electrical engineering who, in the opinion of the electrical engineering faculty, has

attained the highest level of scholastic achievement in all subjects and has rendered significant service to the School of Engineering and the university at large. The award was established in 1958 by the parents of George Sherrerd III, a graduate of the Class of 1955, to recognize outstanding undergraduate scholarship. Recipients receive a monetary award, and their names are inscribed on a plaque displayed in the Engineering Building.

**The Charles Ernest Seager Memorial Award.** This award recognizes outstanding achievement in the annual Student Prize Paper Contest of the Duke branch of the Institute of Electrical and Electronics Engineers or significant contributions to electrical engineering. The award, established in 1958 by the widow and friends of Charles Ernest Seager, a graduate of the Class of 1955, consists of inscribing the name of the contest winner on a plaque displayed in the Engineering Building.

**The Milmmow Prize.** This prize is awarded annually to students from North or South Carolina graduating in the Department of Electrical Engineering, who, in the opinion of the faculty of that department, and, as shown by their grades, have made the most progress in electrical engineering during the last year in school. The prize consists of a certificate of award and one year's payment of dues in the Institute of Electrical and Electronics Engineers for the membership year in which the honoree is awarded the baccalaureate degree.

**The Raymond C. Gaugler Award in Materials Science and Engineering.** This award is presented annually to the senior who has made the most progress at Duke in developing competence in materials science or materials engineering. The basis for selection is the student's scholastic record, research, or design projects completed at Duke, and interest in a materials-related career. The award has been established by Patricia S. Pearsall in memory of her grandfather, Raymond C. Gaugler, who was president of the American Cyanamid Company prior to his death in 1952.

**The American Society of Mechanical Engineers Award.** This award is presented annually to a senior in mechanical engineering for outstanding efforts and accomplishments in behalf of the American Society of Mechanical Engineers Student Section at Duke. The award consists of a certificate of recognition.

**The School of Engineering Student Service Award.** This award, established in 1978, is given to those graduating seniors who, by their contributions of time, effort, and spirit, have significantly benefited the community of the School of Engineering. The names of the recipients are inscribed on a plaque displayed in the Engineering Building.

**The T.C. Heyward Scholarship Award.** This award is presented annually to an outstanding senior in mechanical engineering at Duke University. The recipient is chosen by a committee of the mechanical engineering faculty and selection is based on academic excellence, engineering ability, and leadership. The recipient receives a monetary award and his or her name is inscribed on a plaque displayed in the Engineering Building.

**The William Brewster Snow Award in Environmental Engineering.** This award is presented to an outstanding senior in civil engineering who, through superior academic achievement and extracurricular activities, has demonstrated interest and commitment to environmental engineering as a career. Selection of the recipient is made by the civil engineering faculty. The recipient is presented with an inscribed plaque and his or her name is also inscribed on a plaque permanently displayed in the Engineering Building.

**The Otto Meier, Jr. Tau Beta Pi Award.** This award was established in recognition of Dr. Meier's leadership in establishing the North Carolina Gamma Chapter in 1948 and his continuous service as chapter advisor until 1975. This award is given annually to the graduating Tau Beta Pi member who symbolizes best the distinguished scholarship and exemplary character required for membership. The name of the recipient is inscribed on a plaque displayed in the Engineering Building.

**The da Vinci Award.** This award is presented by a faculty committee of the Department of Biomedical Engineering to the biomedical engineering senior with the most outstanding academic record. This award commemorates the contributions of Leonardo da Vinci in laying the foundations for the study of biomechanics.

**The von Helmholtz Award.** This award is presented by a faculty committee of the Department of Biomedical Engineering to the biomedical engineering senior who has made the most outstanding contribution to the department. This award commemorates the work of von Helmholtz in laying the foundations of biomedical engineering.

**Aubrey E. Palmer Award.** This award, established in 1980, is presented annually by the faculty of the Department of Civil and Environmental Engineering to a civil engineering senior in recognition of outstanding academic achievement. The award consists of a certificate of recognition and the name of the recipient inscribed on a plaque displayed in the Engineering Building.

**The Mechanical Engineering and Materials Science Faculty Award.** This award is presented annually in recognition of academic excellence to the graduating mechanical engineering senior who has attained the highest level of scholastic achievement in all subjects. The name of the recipient is inscribed on a plaque displayed in the Engineering Building.

## GENERAL EXCELLENCE WITH SPECIAL INTERESTS

**The Sirenn WuDunn Memorial Scholarship Fund.** This fund was created by the family and friends of Sirenn WuDunn. An award is made annually to a student who best embodies Sirenn's ideals and interests and who has demonstrated academic excellence and an interest in Asian culture.

**The Raymond D. Lublin, M.D. Premedical Award.** This award to an outstanding graduating senior who will be attending medical school and who has excelled in both science and non-science areas of the curriculum was established in the name of an honored physician and surgeon by his wife, Mrs. Raymond D. Lublin.

**Chester P. Middleworth Awards.** These awards were established to encourage and recognize excellence in research and writing by Duke students in their use of primary source materials held by the Special Collections Library. Two cash awards are made annually to undergraduates through the Special Collections Library, which is housed within Perkins Library.

## SPORTS

**Kevin Deford Gorter Memorial Endowment Fund.** This fund was created by the family of Kevin Deford Gorter to assist, promote, and expand the Sport Clubs program at Duke University. An award is made annually to the student who has made the greatest contribution to the program and best exemplifies the purposes of Sport Clubs at Duke University.

**The William Senhauser Prize.** Given by the mother of William Senhauser in memory of her son, a member of the Class of 1942, who gave his life in the Pacific theater of war on August 4, 1944. This award is made annually to the student in Trinity College of Arts and Sciences or the School of Engineering who has made the greatest contribution to the university through participation and leadership in intramural sports. The winner of this prize is chosen by a committee appointed by the president of the university.

## Education Records

Duke University adheres to a policy permitting students access to their education records and certain confidential financial information. Students may request review of any information which is contained in their education records and may, using appropriate procedures, challenge the content of these records. An explanation of the complete policy on education records may be obtained from the Office of the University Registrar.

No information, except directory information (see below) and notices about academic progress to parents and guardians (see page 49), contained in any student records is released to persons outside the university or to unauthorized persons on the campus, without the written consent of the student. It is the responsibility of the student to provide the Office of the University Registrar and other university offices, as appropriate, with the necessary specific authorization and consent.

Directory information includes name, addresses, e-mail address, telephone listing, photograph, major field of study, participation in officially recognized activities, sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and most recent previous educational institution attended. This information may be released to appear in public documents and may otherwise be disclosed without student consent unless a written request not to release this information is filed in the Office of the University Registrar by the end of the first week of classes each term.







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*Special Study Centers, Programs, and Opportunities*



## Campus Centers and Institutes

### INTERNATIONAL AND AREA STUDIES PROGRAMS

**Center for International Studies.** The university's Center for International Studies promotes, coordinates, and supports a wide array of research and teaching activities on international issues in Arts and Sciences and the professional schools. Faculty associated with the center come from diverse disciplines and reflect a wide range of intellectual interests. Their primary bond is a concern with peoples, events, movements, and institutions outside the United States; relations among nations; and activities and institutions in the United States that affect the rest of the world. The center fosters the belief that comparative knowledge and understanding of other cultures and societies are essential for an appreciation of the world in which we live and deserve primary emphasis in teaching and research in the university.

The functions of the center are to provide focus, structure, and support to the research efforts of associated scholars and to serve as a catalyst for the coordination of varied research undertakings. It also assists in dissemination of these undertakings and fosters international activities in educational, research, and governmental institutions in the local area and in the southeastern United States.

The Center for International Studies is involved in monitoring and initiating change in the international curricula of the undergraduate, graduate, and professional schools of the university. It has a special interest in undergraduate education and, through a variety of programs and activities, makes a contribution to the undergraduate academic experience. It seeks to attract students to the wide range of international and comparative courses available, and it offers awards to rising sophomores for summer travel and research overseas. In recognition of the excellence of its programs, Duke's Center for International Studies has been designated a National Resource Undergraduate Center in International Studies by the U.S. Department of Education.

In addition, the center provides funding for graduate student and faculty travel and research, and for interdisciplinary faculty working groups and committees which

sponsor programs such as visiting speakers, faculty seminars, conferences/symposia, film series, working papers and other activities. Thematic and area studies committees include:

- African Studies
- Comparative Islamic Studies
- Contemporary East Asian Popular Culture
- National Identity, Nationalism, and Ethnicity
- South Asian Studies
- Transitional Issues in the Former Soviet Union

**Asian/Pacific Studies Institute.** This program, administered by the Asian/Pacific Studies Institute, supports and encourages Asian and Pacific studies with special emphasis on China, Japan, and Korea. Courses offered cover a range of disciplines including Asian and African culture, Chinese, Japanese, and Korean (language and literature); art history, cultural anthropology, economics, history, law, political science, psychology, religion, and sociology. The institute provides support for visiting speakers and conferences, library resources and research clusters. A limited number of scholarships and fellowships, including FLAS fellowships, are available annually. Study abroad opportunities are available in China (Duke credit) and Japan (transfer credit). Majors are available at the undergraduate level through the comparative area studies program (East Asian concentration) or through Asian and African Languages and Literature. At the graduate level the institute offers a certificate and M.A. in East Asian Studies.

**Canadian Studies Center.** The Canadian Studies Center administers the Canadian Studies Program, which offers courses introducing students to various aspects of Canadian life and culture. Courses and lectures in a wide range of disciplines in the humanities and the social sciences are designed to increase students' knowledge and understanding of Canada. Special emphasis is placed on Canadian problems and comparisons of Canadian and American perspectives. Concentrations in Canadian studies are described in the chapter "Courses of Instruction." Study abroad opportunities are available.

**Latin American Studies Program.** The Council on Latin American Studies is charged with the oversight and coordination of undergraduate and graduate education in Latin American Studies, and with the promotion of research and dissemination of knowledge about the region. The council offers an interdisciplinary undergraduate certificate in Latin American Studies, which students can earn in conjunction with their bachelor's degree. Additional information about this certificate program can be found in the chapter "Courses and Academic Programs." Faculty associated with the council offer a wide range of courses in the humanities, the social sciences, Portuguese and Spanish. The council also sponsors visiting professors and lecturers from Latin America, a speakers series, conferences, and summer and academic year programs abroad. In addition, the council and the Institute of Latin American Studies at the University of North Carolina-Chapel Hill sponsor the Duke-University of North Carolina Program in Latin American Studies, that includes yearly faculty exchanges of two faculty members from each institution and joint undergraduate and graduate student seminars as well as the annual Latin American Film Festival. For more information consult the program coordinator at 2114 Campus Drive, Box 90254, Durham, NC 27708-0254; telephone 919-681-3980; e-mail: las@acpub.duke.edu; website: <http://www.duke.edu/web/las>.

**Center for Slavic, Eurasian, and East European Studies.** With the support of the U.S. Department of Education, this joint Duke-University of North Carolina Center coordinates interdisciplinary efforts primarily in the fields of Russian (including Soviet)

and East European history, economics, political science, literature, linguistics and language training. Language instruction in Russian, Polish, and Ukrainian is available. The committee also sponsors visiting lectures, conferences, symposia, and films.

**Center for European Studies.** Faculty associated with the Duke-University of North Carolina Center for European Studies promote comparative research, graduate training, and teaching activities concerned with historical and contemporary European issues. Funded in part by the U.S. Department of Education, this program regularly sponsors campus-wide events, such as conferences on contemporary trends in European politics and society and recent developments in the European Union. It also supports faculty-student working groups, curriculum development, and library materials acquisition. A Western Europe concentration is available for Comparative Area Studies majors.

## CENTER FOR DOCUMENTARY STUDIES

This interdisciplinary center for research, teaching, and the dissemination of documentary studies is dedicated to encouraging and supporting the work of photographers, filmmakers, historians, journalists, novelists, and others who work by direct observation and participation in the lives of individuals and communities. A center-sponsored history project, "Behind the Veil: Documenting African-American Life in the Jim Crow South," offers a limited number of assistantships to graduate students in history.

The center also offers courses under the auspices of several Duke departments including history, public policy studies, education, and English. Such courses, often special topics courses, have included American Communities: A Documentary Approach; Advanced Documentary Photography; The Segregated South; and Into the Fields: Migrant and Seasonal Farmworkers in North Carolina.

For more information consult Iris Tillman Hill, Director, Center for Documentary Studies, Lyndhurst House, 1317 West Pettigrew Street, Box 90802, Durham, North Carolina 27708-0802.

## CONTINUING EDUCATION

**Academic Study.** Local adult residents are encouraged to pursue academic study at Duke (1) as potential degree candidates, for those who have not been full-time college students for at least four years and are now resuming or beginning a bachelor's degree; (2) as nondegree students, for those with baccalaureates who now seek a sequence of undergraduate credit courses; and (3) as students completing the last year of work towards a degree at another institution. These students are given academic counseling by the Office of Continuing Education and Summer Session and are subject to most of the regulations set forth for degree candidates. Continuing education applications may be obtained from the Office of Undergraduate Admissions and must be returned to that office, accompanied by a \$35 application fee, by August 1 for the fall semester and by December 1 for the spring semester.

**Short Courses and Conferences.** Short courses (noncredit) in the liberal arts are offered regularly throughout the year for those interested in personal enrichment or career advancement. Conferences, institutes, and training programs are conducted during the academic year and in the summer. Some are residential and others are designed for local participants. Some award continuing education units.

**Test Preparation Program.** Test preparation classes for the GRE, GMAT, and LSAT exams. These courses focus on the skills critical for a good test performance: test-taking techniques, time management, logical reasoning, and math and verbal skills.



**The Institute for Learning in Retirement.** The institute is for persons over fifty years of age who recognize in themselves a need to continue learning and sharing knowledge.

**Duke Institute for English Language and U.S. Culture.** This intensive summer institute is designed to help international students strengthen their English skills.

For brochures on each program and for fuller information, write or call the Office of Continuing Education and Summer Session, Duke University, Box 90700, Durham, NC 27708-0700; 919-684-6259.

## **INSTITUTE OF THE ARTS**

The Institute of the Arts is a center for the interdisciplinary presentation, support, production, and study of the arts. The institute coordinates artist residencies on campus and in the community, presents series in contemporary performance, world music/dance, and modern dance. Working with a representative faculty council, the institute coordinates and supports new curricular initiatives in the arts and develops cooperative programs between Duke and the surrounding community. An undergraduate certificate program in the arts is offered as well as a one-semester, off-campus residency program in New York City every fall semester. The institute provides support for student and faculty projects in the arts and administers awards and prizes. For further information, inquiries should be made to Duke University Institute of the Arts, 109 Bivins Building, Box 90685, (919) 660-3356.

## **INSTITUTE OF STATISTICS AND DECISION SCIENCES**

The Institute of Statistics and Decision Sciences was founded in 1985 to conduct and coordinate teaching and research in statistics and the application of quantitative methods to the study of decision making. The institute offers a wide range of course work and consultation in mathematical statistics, statistical modeling, applied statistics, statistical computing, decision analysis, and utility theory. Students interested in the activities of the institute should consult the institute office, 214 Old Chemistry Building, (919) 684-4210.

## **Specialized Programs**

### **THE FOCUS PROGRAMS**

FOCUS offers first-year students a variety of programs in the fall semester, each featuring a cluster of courses with a common theme. Classes are small, interrelated, and mutually reinforcing; they provide opportunities for discussion from multiple perspectives. Since one of the aims of FOCUS is to encourage the integration of academic life with residential life, participants live in the same residence halls together with non-FOCUS students.

Each of the following FOCUS programs requires participants to take 3.5 courses, including two program seminars, University Writing Course 7, and a half-credit FOCUS Discussion (FOC). The discussion course is designed to provide a social setting for the debate of ideas related to the theme of the program as a whole or of topics of special interest intended to supplement the content of the seminars. It usually meets once a week over dinner.

A current FOCUS brochure and application form may be obtained from the FOCUS Interdisciplinary Program office in the Pre-Major Advising Center (919-684-6217; e-mail FOCUS@pmac.duke.edu). The web page is located at: <http://pmac-www.aas.duke.edu/focus>.

In 1997 the following programs were offered: The Arts in Contemporary Society; Athens in the Golden Age; The Changing Faces of Russia: Redefining Boundaries; Changing Sciences and Changing Societies; Evolution and Humankind; Exploring the Mind; Global Environmental Changes; Globalization and Cultural Changes; Health Care and Society; Medieval Spaces: Cities, Bodies, Monuments, and Spirits; Origins; Twentieth-Century America; and Twentieth-Century Europe. Similar programs will be offered in the fall of 1998.

## RESERVE OFFICER TRAINING CORPS

Duke University and the military services cooperate in offering officer education programs to provide opportunities for students to earn a commission in the United States Air Force, Army, Navy, or Marine Corps. These programs are described below, and detailed information on scholarships, entrance requirements, and commissioning requirements is available from the offices of the Department of Aerospace Studies (Air Force), the Department of Military Science (Army), and the Department of Naval Science. Courses offered in these departments are described in the chapter "Courses of Instruction" in this bulletin.

**The Air Force Reserve Officer Training Corps (AFROTC).** AFROTC selects, trains, and commissions college men and women as officers in the U.S. Air Force. AFROTC offers a four-year and a two-year curriculum leading to a commission as a second lieutenant. The four-year program consists of both the General Military Course (GMC), a course sequence taken during the freshman and sophomore years, and the Professional Officer Course (POC) taken during the junior and senior years. Entry into the POC is competitive and requires successful completion of a field-training encampment during the summer between the sophomore and junior years.

The GMC is open to freshmen and sophomores. Students who complete both the freshman and sophomore years of the program and successfully compete for entry into the POC will attend a four-week training encampment. All other successful POC applicants will attend a six-week encampment. Students interested in the two-year POC program should submit applications no later than early spring semester of their sophomore year. Between the junior and senior years, POC cadets are given the opportunity to volunteer for advanced training in a variety of different areas.

Cadets may compete for two- and three-year scholarships. These scholarships pay up to full tuition, books, and a monthly tax-free stipend of \$150. All members of the POC receive the nontaxable stipend. Upon graduation all cadets are assigned to active duty with the U.S. Air Force for a period of at least four years. Direct inquiries to the Department of Aerospace Studies, 303 North Building, (919) 660-1860.

**The Army Reserve Officers' Training Corps (AROTC).** Army ROTC provides students with an opportunity to earn a commission as a second lieutenant in the U.S. Army, U.S. Army Reserve, or Army National Guard while completing requirements for a baccalaureate degree. Two programs are available, the Basic Course and Advanced Course.

A three- or four-year program consists of the Basic Course (freshman and sophomore years) and the Advanced Course (junior and senior years). Direct entry into the Advanced Course (a two-year program) is possible under specific circumstances. Students wishing to join the two-year program must confer with the Department of Military Science not later than April 1 of their sophomore year. There is only one mandatory summer training requirement, Advanced Camp, which takes place over a five-week period between the junior and senior years. All uniforms and some texts are provided.

Upon commissioning, the service obligation may be fulfilled on active duty, in the Army Reserve, or in the Army National Guard, as directed by the Secretary of the Army. At the beginning of the senior year, cadets submit a preference statement concerning the

method by which they wish to fulfill their service obligation and the specialty in which they desire to serve. A request to delay the fulfillment of the service obligation in order to attend graduate or professional schooling is also authorized.

Cadets are encouraged to compete for Army ROTC scholarships which pay up to \$20,000 towards tuition and fees, a generous textbook and equipment allowance, and \$150 per month for each month in school (up to \$1,500 per year). Nonscholarship Advanced Course cadets also receive the \$150 monthly stipend. All of the above benefits are tax-free. Participants in Advanced Camp are paid one-half of the basic pay of a second lieutenant.

Detailed information is available from the Department of Military Science, 06 West Duke Building, East Campus, Box 90752, (919) 660-3159 or 660-3090, or 1-800-222-9184.

**The Naval Reserve Officer Training Corps (NROTC).** The Department of Naval Science offers students the opportunity to become Naval and Marine Corps officers upon graduation. Selected students may receive up to four years of tuition, fees, uniforms, and textbooks at government expense under the auspices of the Scholarship Program. In addition, scholarship students receive subsistence pay and summer active duty pay of approximately \$1,500 a year. Each summer they participate in four weeks of training either aboard ship or at naval shore facilities to augment their academic studies. Four years of active duty service as a regular officer is required upon graduation.

Nonscholarship students may be enrolled in the College Program. They take the same courses and wear the same uniform, but attend the university at their own expense. Uniforms and naval science textbooks are provided by the government.

College Program students may compete for scholarship status through academic performance, demonstrated aptitude for military service, and nomination by the professor of Naval Science. Students in either program may qualify for a commission in the Marine Corps through the Marine Corps Option Program. Students seeking further information on the NROTC program may call the Department of Naval Science, 225 North Building, (919) 660-3700.

## AGREEMENTS WITH OTHER UNIVERSITIES

**Neighboring Universities.** Under a plan of cooperation, the interinstitutional agreement among Duke University and the University of North Carolina at Chapel Hill, North Carolina State University at Raleigh, and North Carolina Central University in Durham, a student regularly enrolled in Duke University and paying full fees may enroll for one approved course each semester at one of the institutions in the cooperative program unless an equivalent course is offered at Duke in the same calendar year. Under the same conditions, one interinstitutional course per summer may be taken at a neighboring institution participating in this agreement provided that the student is concurrently enrolled at Duke for one full course credit. This agreement does not apply to contract programs such as the American Dance Festival.

Approval forms for courses to be taken at these neighboring institutions may be obtained from the offices of the academic deans at Duke. Only those courses not offered at Duke will be approved. Credit so earned is not defined as transfer credit since grades in courses taken under the interinstitutional agreement are entered on the official record and used in determining the quality point ratio. The student pays any special fees required of students at the host institution and provides transportation.

**Howard University.** Duke students participating in the Duke/Howard University Exchange Program may spend a semester studying at Howard University in Washington, DC, while Howard undergraduates enroll for the same period at Duke. More information about this program, administered by Trinity College, is available in 03 Allen Building.



## **DUKE IN NEW YORK ARTS PROGRAM**

The Institute-of-the-Arts-sponsored Duke in New York Arts Program is a fall-semester off-campus study program for juniors and seniors wishing to engage in an intensive study of the arts that includes an internship. The program has four components, each earning one Duke credit: two seminars taught by the faculty director from Duke (Institute of the Arts 101S and 103S); an arts internship (Institute of the Arts 102); and an elective course at New York University. The internships may be in the fields of visual or performing arts, museum and gallery management, literary arts, film and television, and related fields. A substantive paper is required. For more information, consult Kathy A. Silbiger, Administrative Director, 660-3356.

## **LEADERSHIP AND THE ARTS (pending approval for 1998-99)**

This program is a unique chance for fifteen Duke students to spend the spring semester in New York City studying leadership, policy, philanthropy, and creativity, and learning from people who make art and from others who organize and support it. The program includes four full credit Duke courses. Two public policy courses are required: "Leadership and Quality in the Arts" and "Policy, Philanthropy, and the Arts." A third required course, "Opera at the Metropolitan," is a music course. For their fourth course students may choose from a variety of options in history, religion, art, literature, public policy, and other fields.

Students can expect to see as many as fifteen operas at the Met and more than that number of plays and musicals, in addition to concerts and dance performances. Course assignments also include visits to museums and galleries, and talks with working artists. Choreographers, actors, directors and producers, and supporters of the arts in business, government, and the foundations join the weekly seminars for discussions. Students interested in applying should consult the Hart Leadership Program in the Terry Sanford Institute of Public Policy.

## **DUKE IN LOS ANGELES PROGRAM IN ARTS AND MEDIA**

This interdisciplinary program is sponsored by the Literature and Film and Video programs. It offers students interested in the film, television, music recording, contemporary art, and entertainment law industries an intensive spring-semester program in Los Angeles, based at the University of Southern California. The program consists of a required seminar taught by the Duke faculty director (Literature 197S—Special Topics in the United States Culture Industries); an internship for credit; and two courses at USC in either the School of Cinema-TV or the Division of General Studies. A substantive internship paper is required. For more information, consult Professor Catherine Benamou, faculty director, 681-7446.

## **DUKE UNIVERSITY MARINE LABORATORY**

**(Nicholas School of the Environment)**

The Duke University Marine Laboratory (DURL) is located within the Outer Banks, adjacent to the historic seacoast town of Beaufort, North Carolina, with direct access to the Atlantic Ocean, Cape Lookout National Seashore Park, sand beaches and dunes, estuaries, wetlands, and maritime forests. The dynamic collisions of oceanic currents offshore of the Outer Banks provide excellent opportunities for marine study. A component of the Nicholas School of the Environment, the Duke University Marine Laboratory is an interschool teaching and research facility dedicated to the study of coastal basic processes and human interactions with those processes. The Beaufort campus of Duke has available dormitory and dining facilities, classroom laboratories, research buildings, a specialized marine science library, as well as a variety of boats which are utilized in both teaching and research. A year-round seminar series which



includes both guest lecturers and the resident academic and research staff serves to enrich the student community.

At the undergraduate level, the Marine Laboratory serves students in the natural and environmental sciences as well as those in the social sciences, humanities, or engineering who have adequate preparation. Academic programs include a fall semester, spring Beaufort to Bermuda semester, and two five-week summer terms. The academic programs integrate classroom lectures and laboratories with direct field and shipboard experiences. For additional information and application materials, write to the Admissions Office, Duke University, Nicholas School of the Environment, Marine Laboratory, 135 Duke Marine Lab Road, Beaufort, North Carolina 28516-9721 (919-504-7502 or email [hnearing@mail.duke.edu](mailto:hnearing@mail.duke.edu)).

### **WASHINGTON SEMESTER PROGRAM (American University)**

The Washington Semester Program offers students a chance to take advantage of the resources of Washington, DC. During the program, students are immersed in Washington culture as they work in the nation's capital with the policymakers and business professionals. Washington Semester students earn a full semester of credit by studying in one of these areas: American politics (national government or public law), foreign policy, peace and conflict resolution, justice, and international environment and development. Further information is available in the Department of Political Science, 325 Perkins Library.

### **STUDY ABROAD (Office of Foreign Academic Programs)**

A Duke student may earn credit for approved work completed during the academic year at a foreign university or for an approved program abroad sponsored by Duke or by another approved American college or university in the fall, spring, and summer. To receive the maximum amount of study abroad transfer credit at Duke—generally four course credits for a full semester, eight for a full academic year, two for a summer—a student is expected to take a full, normal course load, as defined by the other institution involved. The responsible Duke departments, however, make the final decision on the final number of credits transferable. Students attending British universities for the full academic year can transfer a maximum of eight courses. However, at British universities which are on the trimester system, only three course credits may be transferred for the single fall semester. Students attending such universities in the spring are generally required to attend the two remaining trimesters and may transfer a maximum of five credits. No additional study abroad transfer credit will be awarded for a course overload. A leave of absence from the university is granted for a semester or academic year of approved study abroad. Duke-administered programs do not involve transfer credit and do not require a leave of absence. To determine eligibility to earn recognition for honors such as Dean's List while studying abroad, consult the section on academic recognition and honors or a Study Abroad Advisor. Arrangements are made normally for students to register, while abroad, for the term in which they plan to return. Seniors planning to spend their last semester abroad are subject to the residence requirement and may face postponed graduation because transcripts from abroad are often delayed. Students studying abroad on programs not administered by Duke will be charged a study abroad fee. See the chapter titled "Financial Information" for information concerning fees for studying abroad on non-Duke programs.

### **Semester and Academic Year Programs**

A student who wishes to receive transfer credit for study abroad should take into account the following criteria established by the faculty and administered by the Committee on Study Abroad:

1. a scholastic average of at least a B- (a student lacking this average may petition the academic dean responsible for study abroad if there are unusual circumstances);
2. certification, when applicable, from the foreign language department concerned, that the student has an adequate knowledge of the language of the country in which study is pursued;
3. approval, obtained before leaving Duke, of the appropriate directors of undergraduate studies for the courses to be taken abroad, as well as approval of the program and the courses by the dean responsible for study abroad and by the student's academic dean;
4. permission for leave of absence once program plans are complete.

Transfer credit will be awarded for work satisfactorily completed abroad when the conditions outlined are met. In addition, the actual grade received abroad will appear on the Duke transcript alongside the indicator that transfer credit was granted. The foreign grades will not be translated, nor will they be computed into the students' grade point average.

Duke, at present, offers various programs in cooperation with other universities during the fall and spring terms. Students accepted may study in the places listed below.

*Australia.* Duke has agreements with a number of top Australian universities, allowing students to become members of outstanding teaching and research institutions in Australia for a semester or an academic year. The universities currently available are the University of Sydney, the University of Melbourne, the University of New South Wales, the University of Western Australia, the University of Queensland, James Cook University, the University of Tasmania, and the University of Wollongong. Applications are available in 121 Allen Building.

*Austria.* From time to time Duke sponsors a term program in Vienna for members of the Wind Symphony.

*Bolivia, La Paz.* This is a fall or spring semester interdisciplinary program in Latin American and Andean studies based at the Universidad Mayor de San Andrés and the Universidad Católica Boliviana. Students take two core courses designed especially for the program, and select their remaining courses from regular Latin American studies offered at the two host universities. Students live with families. Information and applications are available in 121 Allen Building.

*Britain.* Duke has agreements with a number of top British universities, allowing students to become members of outstanding teaching and research institutions in Britain for a semester or academic year. The universities currently available are the University of London (King's College, Imperial College of Science, Technology and Medicine, the London School of Economics and Political Science, Queen Mary and Westfield College, and University College); the University of Birmingham; the University of Bristol; the University of Durham; the University of Edinburgh; the University of Glasgow; the University of Manchester; St. Andrew's University; the University of Sussex; and the University of Warwick. There is a special program for engineers at University College London. Applications are available in 121 Allen Building.

*Canada, Montreal.* Duke students participating in the Duke/McGill University Exchange Program may spend one semester or academic year at McGill, located in the city of Montreal, Québec. Because the language of instruction at McGill is English, program applicants need not have studied French although some knowledge of it would be advantageous. The program is sponsored by the Canadian Studies Center and Trinity College; information and application forms are available in 121 Allen Building.

*China.* In cooperation with Nanjing University and Capital Normal University, Duke conducts a six-month study program in the People's Republic of China in the summer and fall terms. The program includes a fall term at Nanjing University preceded

by an intensive language session in Beijing. Participants must have at least one year of Chinese language. Information is available from the Asian-Pacific Studies Institute, 2111 Campus Drive, and in 121 Allen Building.

*Costa Rica.* This fall or spring semester program is co-sponsored by Duke and the Organization for Tropical Studies. Students will take four core courses in tropical biology and Spanish language and Latin American culture. The program stresses full immersion in hands-on scientific and language-cultural studies. Students live for three weeks with families, and in dormitories of three research stations. Information and application forms are available in 121 Allen Building.

*Egypt, Cairo.* Through an agreement with the American University in Cairo, Duke students may spend a spring semester or academic year there taking regular classes with Egyptian students. They may enroll in general courses in humanities, social sciences, and sciences, as well as in Arabic language and specialized courses in Middle Eastern studies. Applications are available in 121 Allen Building.

*England, Bristol.* This spring semester program which offers an intensive study of dramatic literature and drama in performance is based at the Department of Drama, Film and Television at the University of Bristol. Students take a full load of courses at Bristol, and a special course designed for the program which includes extensive theater experience in London and Stratford-upon-Avon. Information and applications are available from 121 Allen Building.

*England, Oxford.* Through a special arrangement with two colleges at the University of Oxford, selected Duke students may spend their junior year at Oxford as regularly enrolled visiting students. The students are treated exactly like their British counterparts, and most of them live in college housing. Students may choose to concentrate their study in any one of the major fields in the humanities, social sciences, or selected natural sciences. Each student is assigned a tutor. Applicants must have a very strong academic record; previous course work in the subject to be pursued at Oxford is also required. Admission to this program is at the discretion of the University of Oxford. More information may be obtained in 121 Allen Building.

*France, Paris.* Duke offers a full-year program in Paris in conjunction with the University of Paris I, IV, and VII. The language of instruction will be French. One course will be offered by the resident director, and three courses will be taught by the Parisian faculty. Applicants must have completed four semesters of French plus two courses at the 100-level or above with a grade of at least B+. Priority will be given to juniors and full-year applicants, although some participants may be admitted for one semester only. More information may be obtained in 121 Allen Building or the Department of Romance Studies, 205 Languages Building.

*Germany, Berlin.* Duke students study at the Humboldt University of former East Berlin (fall) and at the Free University of former West Berlin (spring). In the fall semester they take specially arranged courses in German language and literature and the social sciences for Duke credit. In the longer spring semester, up to 5 courses may be taken and up to two courses can be chosen from the regular course offerings of the Free University. One year (fall or year program) or two years (spring program) of college-level German or its equivalent are required. More complete information may be obtained in 121 Allen Building.

*Italy, Rome.* As the managing institution of the Intercollegiate Center for Classical Studies in Rome, Duke University may send classics majors and other students with strong classical interests for admission to a term's work at the center, usually in the junior year. Instruction is offered in Greek, Latin, ancient history, ancient art, and archaeology. Some scholarship help is available. Additional information may be obtained from the Department of Classical Studies, 236 Allen Building or 121 Allen Building.



*Japan, Tokyo.* Qualified students may be recommended each year by the Asian-Pacific Studies Committee for the junior year exchange program with International Christian University in Tokyo. This small, select university is noted for the international character of its student body (85-90 percent Japanese, 10-15 percent non-Japanese, primarily from other Asian nations and the United States). Courses may be taken in English as well as Japanese. More information is available from the Asian-Pacific Studies Institute, 2111 Campus Drive, or 121 Allen Building.

*Russia, St. Petersburg.* This fall or spring semester program is offered for undergraduate and graduate students who have studied Russian for two years at the college level. Students are enrolled in the State University in St. Petersburg and will have the opportunity to improve their language skills in a living-learning environment. All courses are taught in Russian. Students are housed with families. Information and applications are available from 121 Allen Building.

*Scotland, Glasgow.* The Department of Public Policy Studies offers departmental majors the opportunity to study during the fall semester of their junior or senior year at the University of Glasgow where, practically speaking, public policy analysis was invented. Students will live on campus and will take the program's special seminar in public policy in addition to three electives from the general university curriculum. Further information may be obtained from the director of undergraduate studies in the Department of Public Policy Studies, Sanford Institute of Public Policy.

*South Africa.* Beginning Fall 1997, Duke students may enroll in three of the leading universities of South Africa with which Duke has agreements. Students may matriculate at the University of Cape Town, Rhodes University in Grahamstown, or at the University of Natal in its Durban or Pietermaritzburg Centres, and will become visiting students at these institutions for either a semester or an academic year.

*Spain, Madrid.* This program offers advanced students a variety of on-site experiences and an opportunity to hear and speak Spanish in an ideal environment. The program offers courses in Spanish history, culture, literature, politics, and arts, as well as several organized excursions. Students are housed with selected Spanish families. More information may be obtained in the Department of Romance Studies, 205 Languages Building, or in 121 Allen Building.

A number of additional approved programs sponsored by other institutions are also available to Duke students for study abroad. Further information concerning semester and academic year programs, as well as summer programs, may be obtained in 121 Allen Building. All Trinity College students are responsible for following the procedures and meeting the deadlines set forth in materials available in 121 Allen Building. In all cases, the dean of study abroad must be informed in advance about a student's plans.

### **Duke Summer Programs Abroad**

The Office of Foreign Academic Programs, in cooperation with several university departments, provides many opportunities for students to study abroad during the summer while earning Duke University credit. Information about Duke Summer Programs Abroad and about the time they will next be offered can be obtained from the program directors or the Office of Foreign Academic Programs, 121 Allen Building.

*Australia, Sydney.* This two-course, six-week program will focus on Australian environmental studies and will be based in Sydney at the University of New South Wales. One course, to be taught by a professor at the University of New South Wales, will deal with Australian studies. The second course will focus on environmental/ecological issues and will be taught by a professor of Duke University, who will also direct the program. Students will be housed in accommodations at the University of New South Wales. For further information consult the Office of Foreign Academic Programs, 121 Allen Building.



*Belgium/Netherlands.* This two-course, six-week program will focus on a contextual study of Late Medieval, Renaissance, and Baroque art and culture in Belgium and the Netherlands. The double-credit course is: Art and Cultural History of Flanders and the Netherlands from the Fifteenth through the Seventeenth Centuries (AL) (cross-listed with Comparative Area Studies) taught in English by Professor Hans van Miegroet of Duke, Dutch and Flemish guest lecturers, and art specialists. The program is based for the first two weeks in Amsterdam (Netherlands) and for the remaining four weeks in Gent (Belgium). Participants visit numerous Dutch and Belgian cities and museums. Accommodations are in hotels. For further information consult Professor Hans van Miegroet, Department of Art and Art History, 112 East Duke Building or the Office of Foreign Academic Programs, 121 Allen Building.

*Canada.* This two-course, six-week program provides a complete immersion in French. This is an exchange program; students receive transfer credit for work successfully completed. Students are placed in one of nine levels of language instruction during the program. Upon return they are tested and then placed in the appropriate Duke level if they intend to continue with French language studies at Duke. Instruction and accommodations are by the University of Québec, Trois Rivières campus. For further information consult Janice Englehardt, Canadian Studies Program, 2016 Campus Drive or the Office of Foreign Academic Programs, 121 Allen Building.

*France, Paris.* This two-course, six-week program provides the opportunity to take Duke courses in the ambience of Paris. Aspects of Contemporary French Culture (CZ, FL) (cross-listed with Comparative Area Studies), is a conversation course taught by a native French speaker; the second course is offered by the Duke director. Four semesters of college French or equivalent are required. Students live in dormitory-style accommodations. For further information consult the Office of Foreign Academic Programs, 121 Allen Building.

*Germany, Erlangen.* (German Language and Culture Program.) Duke offers two programs at the Friedrich-Alexander Universität at Nürnberg. One program (mid-May to the end of June) provides an opportunity to study classroom German at different levels while living with a German family and participating in study, day trips, and excursions. The courses are: Advanced Grammar Review, Composition, and Current Issues (FL); Aspects of Contemporary German Culture (CZ, FL) (cross-listed with Comparative Area Studies). Two semesters of college German or the equivalent are required. In the other program (early May to the end of July), advanced students may choose from a variety of FAU courses all taught in German and remain for a full summer semester (through early August). Semester program students live in dormitories. For further information consult Professor Helga Bessent, Department of Germanic Languages and Literature, 116 Old Chemistry Building or the Office of Foreign Academic Programs, 121 Allen Building.

*Greece.* A four-week, one-course program in Greece focuses on the cultures of ancient Greece. The course: Ancient Greece (CZ), is taught by Professor John Younger of Duke University who will also be the program director. The course concentrates on Athens and southern Greece and consists of on-site lectures at numerous sites of historical and archaeological interest throughout the area. Travel will be provided in Greece by private coach. Accommodations will be in hotels. For further information consult Professor Younger, Department of Classical Studies, 228 Allen Building or the Office of Foreign Academic Programs, 121 Allen Building.

*Israel, Galilee.* This two course, six-week program gives students an opportunity to participate in an archaeological dig. The program is designed to introduce students to the discipline of field archaeology and to the religious, social, and cultural history of ancient Palestine from the Greek period to the Islamic period. The field excavations are located in Galilee at ancient Sepphoris, the administrative capital of that region in the first century C.E. Students register for Perspectives in Archaeology (CZ), taught by Duke

staff and Religion 110: Archaeology and Art of the Biblical World taught by Professor Eric Meyers of Duke. All courses are taught in English. For further information consult Professor Eric Meyers, Department of Religion, 118 Gray Building or the Office of Foreign Academic Programs, 121 Allen Building.

*Italy, Rome.* This one-course, three and one-half week program in Rome explores the history and culture of Rome and includes visits to historical sites and museums, walking lectures, and readings. The course Classical Studies 145/Art 126: Rome: History of the City examines the history of the city from the earliest times through the Baroque and modern periods. The course is taught in English. Students will have accommodations in the Intercollegiate Center for Classical Studies. For further information consult the Office of Foreign Academic Programs, 121 Allen Building.

*Italy, Venice.* This two-course, six-week program will focus on Venetian history, art and literature. Courses will be taught in English under the direction of a Duke professor. Students live in a dormitory of the Venice International University on San Servolo Island.

*Morocco.* This two-course, six-week program offers the opportunity to study North African religion and Moroccan culture in Marrakesh at Mohammed V University, Rabat. Courses are taught in English. Field trips are part of the courses. Accommodations are in hotels. For further information consult Professor Vincent Cornell, Department of Religion, 115 Gray Building or the Office of Foreign Academic Programs, 121 Allen Building.

*Russian Republic.* This program offers two Russian language and culture courses in St. Petersburg. Russian language study at different levels will be offered. Classes in St. Petersburg will be taught at the University of St. Petersburg by faculty members of the university. Prerequisite: a minimum of two semesters of college-level Russian is suggested. Students will be housed in an apartment-hotel. For further information consult Professor Edna Andrews, Department of Slavic Languages, 314 Languages Building or the Office of Foreign Academic Programs, 121 Allen Building.

*Spain.* This two-course, six-week program in Seville and Madrid offers advanced Spanish students further language training as well as the opportunity to study Spanish culture, history, and politics. Participants can choose two of the following courses: Spain, Yesterday and Today (CZ, FL); Art and Civilization (CZ, FL); Literature and the Performing Arts (AL, FL); and Government and Politics of Spain (SS). There will also be excursions to Barcelona, Salamanca, Toledo, Segovia, Granada, Sevilla, and Cordoba. All courses are conducted in Spanish, and students live with Spanish families. For further information consult Professor Miguel Garci-Gómez, Department of Romance Studies, 205 Languages Building or the Office of Foreign Academic Programs, 121 Allen Building.

*United Kingdom, Cambridge.* This two-course, six-week program directed by Professor Wesley Kort of Duke University focuses on the interrelations among fiction, religion, and the changing cultural climate in England from the Victorian period to the present day. The courses are taught by Professor Kort along with guest lecturers. Accommodations will be at a Cambridge college. There will be frequent weekend excursions. For further information see Professor Wesley Kort, 328 Gray Building, or the Office of Foreign Academic Programs, 121 Allen Building.

*United Kingdom, London-Drama.* This two-course, six-week program offers the opportunity to study drama using the resources of London's theaters in conjunction with study of dramatic texts. The courses are Theater in London: Text (AL) and Theater in London: Performance (AL). Both courses are taught jointly by Professor John Clum of Duke and a distinguished group of British theater practitioners from London and Bristol. The group will attend many theater productions in London and at Stratford-upon-Avon. Accommodations are in a dormitory of the University College, London. For further information consult Professor John Clum, 212 Bivins or the Office of Foreign Academic Programs, 121 Allen Building.

*United Kingdom, London.* This six-week program will explore and analyze British government and politics, the British media, and the relationship between the two. Students will take a double-credit course, Politics and the Media in Britain (SS, C-L: Comparative Area Studies), taught jointly by Professor David Paletz of Duke University and British faculty members. Optional internships are available. Accommodations are in a dormitory of University College, London. For further information consult Professor David Paletz, Department of Political Science, 214 Perkins, or the Office of Foreign Academic Programs, 121 Allen Building.

*United Kingdom, Oxford.* This six-week session at New College, Oxford, utilizes the Oxford tutorial system of education supplemented by lectures given at the University of Oxford's International Graduate Summer School by noted British scholars. Areas of study include Renaissance British Literature, Nineteenth-Century British Literature, Modern British History, Politics and Government in Britain since 1945, and Law: Personal Injuries in the United Kingdom and the United States. For further information consult Professor Melissa Malouf, 012 Social Sciences or the Office of Foreign Academic Programs, 121 Allen Building.

## Special Summer Programs

### DUKE SUMMER FESTIVAL OF CREATIVE ARTS

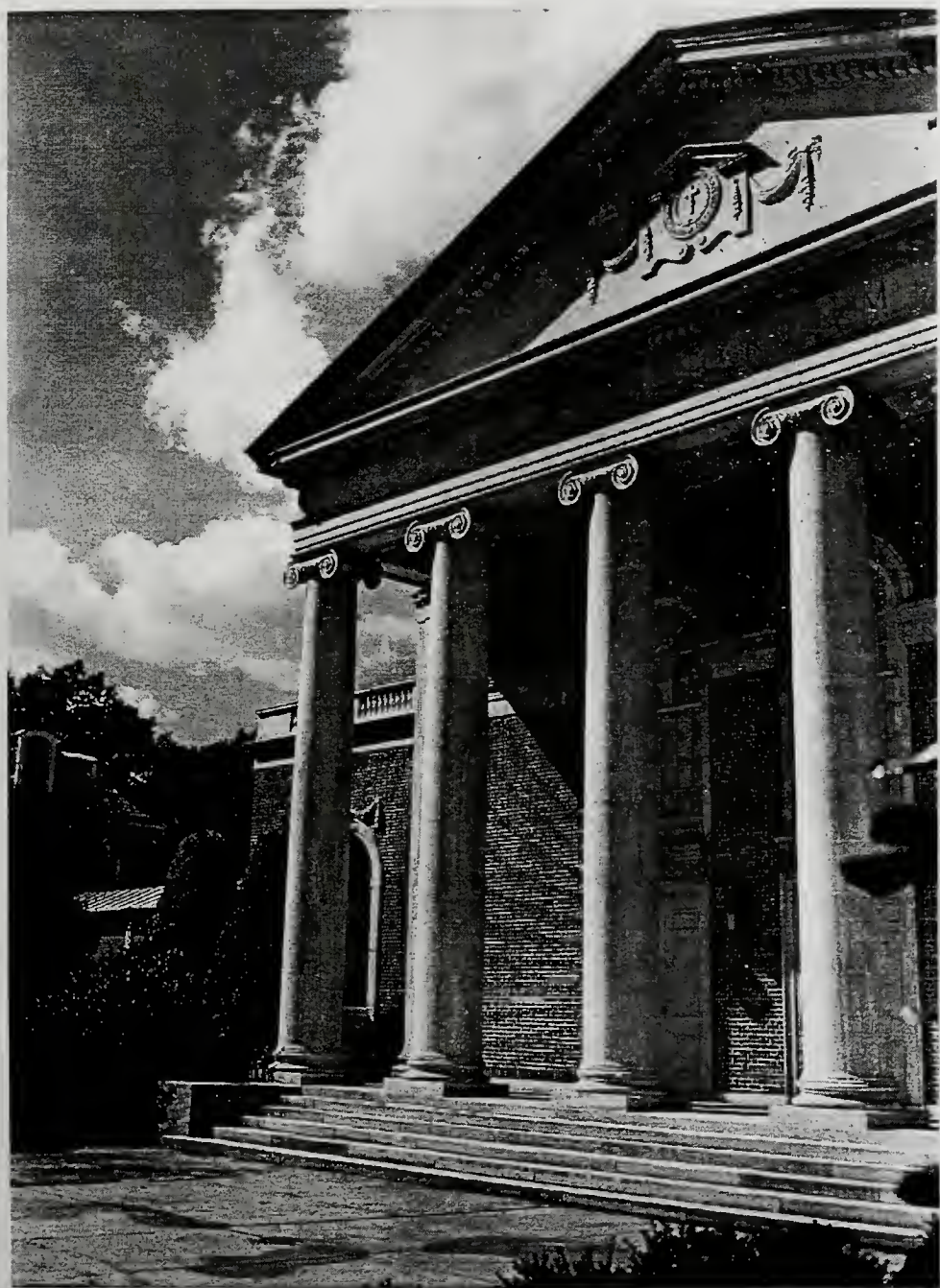
The Duke Summer Festival of Creative Arts is administered jointly by the Summer Session Office and the Office of University Life. The festival provides an exciting, artistically stimulating environment for the campus and community. The Ciompi Quartet, Duke's well-known chamber music ensemble, will perform. Other special events such as jazz concerts, carillon recitals, dance performances, and film series are planned.

**The American Dance Festival.** The six-week program offers a wide variety of classes, performances, and workshops. For a catalog, write to the American Dance Festival, Duke University, Box 90772, Durham, North Carolina 27708-0072, or telephone (919) 684-6402.

### PRECOLLEGE PROGRAM

During the summer of 1998, Duke University will offer a Term II program for academically talented rising high school seniors from across the country. The PreCollege Program is designed to provide the academic challenge of college-level courses to qualified college-bound students and to help prepare them for the adjustments they will be making when they enter college. Students will enroll in two regular summer session classes with Duke undergraduates. Introductory level courses in the humanities, social sciences, and natural sciences will be offered for college credit. The students will live in supervised, air-conditioned university dormitories, eat their meals in the university dining halls, enjoy the opportunity of studying with distinguished members of the Duke faculty, and will have access to all university libraries and athletic facilities. In addition to the classroom experience, PreCollege students participate in a range of programs and activities designed to aid them in college selection, career exploration, and intellectual and social development. For further information consult the PreCollege Program, Duke University, 1121 West Main Street, Suite 100, Durham, North Carolina 27708-0780, (919) 683-1400.







## *Campus Life and Activities*



## Student Affairs

The mission of Student Affairs is to create opportunities and challenges for students to broaden their intellectual, social, spiritual, and emotional horizons; and, in so doing, to engage them with the widest range of persons both within the university and beyond in striving towards a community that fosters social responsibility and reflects the highest aspirations of all its members.

The Division of Student Affairs complements the educational mission of the university by helping to relate many of the nonacademic components of the university to the academic experiences of the students. The residence halls, the athletic fields, the Chapel, and many student organizations play an important humanistic and holistic role in the students' university experience by developing leadership qualities, skills in interpersonal relationships, and appreciation for the care of the physical self. Thus, the university experience encompasses collectively the life of the mind, body, emotions, and, indeed, the spirit.

## Residential Life

Duke enjoys a long tradition as a residential university and supplements the formal academic education of students by providing a comprehensive residence life program. A primary goal is to facilitate the creation of residential communities in which there are common interests, free-flowing exchange of ideas, relaxed social activities, and active recreational opportunities. Students, faculty, and staff work cooperatively to provide programs and activities in keeping with these guiding principles. Leadership opportunities, faculty dinners/discussions, community service opportunities, and intramural sports are but a few of the offerings in which students may choose to become involved.

First-year students, with the exception of those who petition to live at home, are required to live in university residence halls. After the first year, students may elect to reside in selective and independent residence halls or the Central Campus apartments. Nearly 90 percent of the undergraduate student body lives on campus each year, a clear indication of student appreciation for and satisfaction with the residential experience. Students enrolled beyond their fourth year and those who attend part-time are not eligible for university housing.

*First-Year-Student Residence Halls.* First-year students reside on East Campus in first-year student houses, the majority of which are coed. A faculty member lives in-residence in all but two of the first-year houses. All housing assignments are made by random lottery. Within the residence halls, single, double, or triple rooms are available.

*Upperclass Residences.* Upperclass students live in coed and single-sex residence halls on West and North Campuses and in the Central Campus Apartments. There are two types of residence hall living groups, independent and selective. Independent living group spaces are filled by a general housing lottery. The selective living groups, which include residential fraternities, select their own members. Also included among the selective houses are academically sponsored theme houses such as the Decker Tower Languages House, the Mitchell Tower Arts House, the Round Table, and the Ann Firor Scott Women's Studies House. Other selective houses include PRISM, a multicultural theme house, and the Women's Selective House (Cleland). Each living group or house is governed by a House Council elected by the group's membership. Within all upperclass houses, except those located in Edens, there are triple as well as single and double rooms. Central Campus provides another housing option—a community of university-owned and operated apartments which accommodate nearly 800 undergraduate students. The remainder of the complex houses a cross-section of 200 students from various graduate programs.

University housing is considered to include all residence halls as well as Central Campus Apartments, and assignment to any of these areas fulfills the university's four-year housing guarantee to eligible students. Since the 1995-96 academic year, entering students have been required to live on-campus for three years, and after that commitment has been met, they may consider moving off-campus or continue to enjoy their four-year housing guarantee option. Eligible students who choose to live off-campus may retain their resident status and eligibility for university housing if they follow the proper procedures as published by the Office of Student Development. The university provides free on-campus bus service, connecting East, West, North, and Central campuses.

All residence halls have resident advisors who live in-house and who are members of the Office of Student Development staff. These graduate and undergraduate students have broad responsibilities in the residence halls which include advising the house leadership, serving as valuable resource persons for students with a variety of questions or personal concerns, and enforcing university policies when individual or group behavior fails to conform to the standards set forth by members of the university community.

Each house is located within a residential quadrangle, and a quadrangle council will be elected from its constituent members to perform the dual roles of programming and governance. The primary purpose of the quadrangle system is to establish and sustain a vibrant residential community, facilitated by a rich blend of intellectual and co-curricular pursuits. Quadrangle members will pay dues, set by the membership, as a means of supporting the programming initiatives designed for the enrichment of the community in which they live. Representatives from each quadrangle council shall comprise the Campus Council which serves as the governing body to support and provide direction for residential life. A subcommittee of the Campus Council also will serve as an advisory body to the dean of student development, and will seek, through its action, to foster an environment of responsibility, initiative, and creativity on the part of all individual students and groups living in residence.

**Residence Hall Programming.** Educational and cultural programming is planned and presented throughout the year in the residence halls through the cooperative work of the Office of Student Development, Trinity College of Arts and Sciences, the School of Engineering, and resident students. In all but two of the first-year residence halls, faculty members live in the halls and participate in house activities during the academic year. The Faculty Associates Program pairs faculty members with living groups in an effort to facilitate engaging and intellectually stimulating endeavors within the residence halls. There are a number of seminar rooms located in several of the first-year



houses. The goals of these various residentially-based programs are to enhance the quality of intellectual and social life for the residents on campus, to facilitate student-faculty interaction outside the formal classroom setting, and to develop a greater sense of community within the individual residence halls as well as within the greater university.

## Dining Facilities

All students living in campus residence halls are required to participate in a dining plan. Several dining plans are available that allow a student to make purchases in a wide variety of dining locations by accessing a prepaid account carried on the student identification card, or Duke Card (see 'Food and Other Expenses' in the chapter "Financial Information"). First-year plans include both board and debit accounts; plans for upper classmen are debit accounts.

Duke Dining Services provides four cafeterias, six fast food locations, two restaurants and three coffee bars. Facilities on East Campus include The Marketplace which serves the first-year plan (featuring fresh baked goods, rotisserie roasted meats, steamed vegetables, stir-fry specialties, pizza, pasta grilled sandwiches, and an extensive salad bar) and Trinity Cafe (gourmet coffee and pastries). West Campus options include The Great Hall (cafeteria), Han's Fine Chinese Cuisine (restaurant), the Oak Room (restaurant), the Cambridge Inn (featuring L'il Dino Subs, Chick-fil-A and Fresh Fare to Go), the Rathskellar (Tex-Mex, pasta, and sandwiches), The Cafe and The Perk (gourmet coffee and pastries), LSRC Dining Room (cafeteria), and fast food outlets Burger King, Sanford Institute Deli, J.D.'s, and CI North. North Campus is home to Trent Cafe, and on Central Campus there is Duke's own sports bar, The Devil's Den. Additionally, University Catering accepts dining plan funds from individual students or student groups and will provide food and/or catering services for cookouts, study breaks, banquets, parties, or any other campus event. Students may also use the funds in their dining plan to purchase food items in three campus convenience stores: Uncle Harry's General Store on Central Campus, The East Campus Store on East Campus, and the Lobby Shop on West Campus as well as concessions at athletic events, sodas and snacks from vending machines, and late night pizza and sub delivery from local commercial vendors.

## Religious Life

Two symbols indicate the importance of religion to this university since its founding: *Eruditio et Religio*, the motto on the seal of the university, and the location of the Duke Chapel at the center of the campus. People from all segments of the university and the community gather in Duke Chapel on Sunday morning to worship in a service which offers excellent liturgy, music, and preaching. The world's outstanding Christian preachers have preached from the Duke Chapel pulpit.

The dean of the Chapel and the director of Religious Life work with the campus ministers and staff from the Roman Catholic, Jewish, and Protestant communities, and with other groups to provide a ministry which is responsive to the plurality of religious interests on the campus.

Through the religious life of the university, students are encouraged to search for meaning, to ask the ultimate questions, to worship, to meditate in the beautiful chapel, to learn from outstanding theologians from a wide array of traditions, and to work to bring about a more just and humane society.

## Services Available

**The Office of Student Development.** This office works with Duke students in a variety of ways and is dedicated to creating a residential community supportive of a rich educational experience. It advises individual students regarding personal problems,



houses undergraduates in the residence halls, and assists students to plan and present educational and cultural programs within the residence halls.

One hundred thirty-one resident advisors (RAs), staff members of the Office of Student Development, reside in the residence halls and are directly responsible for the administration of the student residences and their programs. Resident advisors guide and support the efforts of their respective house councils, serve as valuable resources for students with a variety of questions and needs, and enforce university policies when required.

Members of the Office of Student Development staff advise and support a number of residentially-based governing bodies, notably the East Campus Council, the eight quadrangle councils, Central Campus Council, and the Campus Council. The office also plans and implements New Student Orientation and coordinates the first-year-student advisory counselors (FACs), upperclass men and women assigned to small groups of entering students, who, during orientation, welcome their groups and help to acquaint them with the university.

Judicial affairs are handled through the office by coordinating and applying the general rules and regulations of the university as well as working with all participants involved in the judicial process and coordinating the student advising system.

The Office of Student Development also works with transfer students and oversees the university's response protocol to student emergencies.

**The Student Health Service.** The Student Health Service, which provides medical care, advice, and education for all currently enrolled full-time students and part-time degree candidates, is administered by the Department of Community and Family Medicine, Duke University Medical Center.

The primary location for medical care is the Duke Family Medicine Center (Marshall Pickens Building) where students are seen, by appointment, for assessment and/or treatment. Students residing on East Campus may also use the East Campus Wellness Clinic in Wilson Hall for assistance in accessing appropriate clinical services. When a student's health needs warrant additional specialized treatment, the Duke Family Medicine Center serves as a portal of entry to other health resources within the Duke medical community. The infirmary, another Student Health facility, provides inpatient treatment of illnesses too severe to manage in residence halls or apartments, but not requiring hospitalization. If necessary, Duke Public Safety provides on-campus transportation to the health care facilities. A Student Physical Therapy Clinic in Card Gym is also available for treatment of sports-related injuries.

The health education component of Student Health is located at the Healthy Devil Education Center on West Campus, and a satellite office is located on the third floor of Hanes Hall. A full-time health education staff is available to assist students in making informed decisions that lead to healthy lifestyles at Duke and beyond. Topics of concern and interest include alcohol and other drug usage, eating and nutrition, sexuality, and stress management. Programs, meetings, and consultations are provided for groups and individuals.

A list of students in the infirmary or hospital is routinely provided to the academic deans, who issue excuses to students when appropriate. However, information regarding the physical or mental health of Duke students is confidential, released only with the student's permission. This policy applies regardless of whether the information is requested by university officials, friends, family members, or health professionals not involved in the student's immediate care.

All currently enrolled full-time students and part-time degree candidates are assessed a Student Health Fee for each enrolled semester. This covers most of the services rendered within the Student Health Service. An optional Summer Health Fee for students who are not enrolled in summer sessions is also available through the bursar's office.

In addition to the Student Health Service, the university makes available a plan of accident and sickness insurance to protect against the high cost of unexpected illnesses or injuries which are not covered by the Student Health Fee and would require hospitalization, surgery, or the services of specialists. This insurance covers students both on and off campus, at home, or while between home and school during interim vacation periods throughout the one-year term of the policy. All full-time students and part-time degree candidates are required to enroll in this insurance policy unless they show evidence that they are covered by other generally comparable insurance. This waiver statement, contained in the remittance form of the university invoice, requires that the name of the insurance company and policy number be indicated as well as the signature of the student or parent. International students, as well, are required to show proof of health insurance coverage (either the policy offered by Duke or comparable coverage) and may not assume responsibility for personal payment of health care cost.

Upon arrival on campus, all students should familiarize themselves with the Healthy Devil Online, the web page for student health, where information about hours of operation, available services, and other helpful information is posted. During the academic year they may call 684-3367 twenty-four hours a day for information or advice.

**Counseling and Psychological Services.** Counseling and Psychological Services (CAPS) provides a range of counseling and developmental services in support of the academic endeavors of students. The professional staff is composed of psychologists, clinical social workers, and psychiatrists experienced in working with college students. They provide evaluation and brief counseling/psychotherapy for a wide range of concerns, including such issues as self-esteem and identity, family relationships, academic performance, dating, and intimacy and sexuality concerns. While students' visits with counselors are usually by appointment, emergencies are addressed when they arise.

Each semester, CAPS offers a series of counseling groups and seminars focusing on enhanced self-understanding and coping strategies. Support groups have been offered for second generation Americans; African-American students; students completing dissertations; students with bulimia; and gay, lesbian, and bisexual students. Seminars have addressed such topics as stress management, social skills development, and dissertation problems.

As Duke's center for administration of national testing programs, CAPS also offers a wide variety of graduate/professional school admission tests at no cost to students. The staff is also available to the university community for consultation regarding student development and mental health. CAPS' staff work with campus personnel, including administrators, faculty, student health staff, religious life staff, resident advisors, and student groups, in meeting mental health needs identified through such liaisons. Staff members are also available to lead workshops and discussion groups on topics of interest to students.

CAPS, consistent with professional ethics and North Carolina law, maintains a policy of strict confidentiality concerning information about each student's contact with CAPS. If a student desires information to be released, written authorization must be given. CAPS' services are covered by the student health fee. There are no additional costs for these services.

For additional information, see the *Bulletin of Duke University: Information and Regulations*, or call (919) 660-1000.

**Career Development Center.** The mission of the Career Development Center is to educate the students of Duke University in the arts of self-assessment, career exploration, career planning, and job hunting with the goal of helping them develop rewarding and fulfilling careers. The center primarily serves the students and alumni of Trinity College, the School of Engineering, and the Graduate School.

Career counselors are on staff helping students early in their lives at Duke to begin the process of discovering career interest. Career specialists then help students focus on specific career fields, including the arts, business, community service, education, engineering, mathematics, computer science and the physical sciences, government, health and life sciences, international careers, and mass media. Career specialists also work closely with the faculty and the deans of Trinity College in directing students' interest towards effective application to graduate and professional schools.

Programs and services of the center include the Ventures Internship Program offering semester-long internships in local area businesses, the Health Careers Internship Program offering experiences at the Medical Center and elsewhere in Durham, the Duke Summer Alum Mentorship Program offering summer mentorships with alumni in the medical professions, the Service Learning Project offering stipends for summer work in community service, the On-Campus Recruiting Program offering interviews for summer and permanent positions with a wide variety of national organizations, and the Credential Service which collects and sends letters of recommendation. The Center also hosts annual job fair events and sponsors regular career symposia, seminars, and workshops.

The Career Development Center's web site is a comprehensive Internet resource for students and alumni and offers updated information in support of the career discovery and job search processes. *News This Week*, an Internet career newsletter, is designed to keep students constantly aware of career-related opportunities on- and off-campus. Announcements of job openings, career seminars, workshops, and information sessions are posted each week. The center moderates more than forty electronic mailing lists alerting students and alumni to important career events and opportunities. The Career Library and J.O.B. Room provide a wealth of printed and database materials on specific career fields and specific employers. By using the CDC web site, a student may review bulletins, information about the center, summer and full-time job listings, and register to participate in center programs. Visit the website at <http://cdc.stuaff.duke.edu>.

**Sexual Assault Support Services.** Located in the Women's Center, the Office of Sexual Assault Support Services offers advocacy, support, and twenty-four hour crisis intervention services to survivors of rape, sexual assault, child sexual abuse, or relationship violence and to their friends and families. The S.A.S.S. coordinator coordinates peer support networks, trains groups such as the resident advisors and DARE (Duke Acquaintance Rape Education), and initiates ongoing educational programs to alert students to problems of sexual assault and interpersonal violence.

**Services for Students With Disabilities.** Duke University admits students without regard to disability and offers reasonable accommodations to the needs of students with disabilities. The Office of Institutional Equity has been designated to ensure that the university is in compliance with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act of 1990. Several other offices and individuals assist the office in a continuing effort to make its programs and services accessible to members of the Duke community. Undergraduate students who have special needs, including those related to physical and learning disabilities, may seek assistance at the Academic Skills Center. Consult the program coordinator at 919-684-5917.

## Offices for Program Planning

**The Office of University Life.** The Office of University Life helps enhance the climate of the campus through the programming efforts of such organizations as the University Union, the Duke Artists Series, Broadway at Duke, Duke Debate, the Craft Center, and through advising student clubs and organizations. The Bryan Center Information Desk is also under the auspices of this office.



The Office of University Life is responsible for the creation, coordination, and implementation of many of the cultural and popular entertainments which take place on campus. The office is responsible for the Chamber Arts Society Series; it also schedules the use of Page Auditorium and directs the use of this hall. For the Summer Session Office, this office directs the Duke University Summer Festival of the Arts and works with the Institute of the Arts. In addition to these arts-related activities, the Duke University Yearly Calendar is published and distributed from this office. All campus events should be recorded by the calendar office as early as possible in order to avoid conflicts. The office, with the Event Advising Center, serves in an advisory capacity to student groups sponsoring and registering major events.

The Office of University Life also serves as a resource for student organizations, student leaders, the Duke University community and the community-at-large, in a manner which fosters an environment of trust and exploration of new experiences. As such, the staff members serve as educators and direct service providers, developing a community that strives toward excellence. To these ends, the office promotes the development of leadership skills through a variety of programs which both educate and support individual students and student organizations, while recognizing and saluting their efforts; is the central resource for information concerning student organizations, acting both as a liaison and an advocate; facilitates the financial management of organizational funds, both providing counsel and direct services.

Another responsibility of the Office of University Life is advising the Duke University Union which was founded in 1955 "to promote social, cultural, intellectual, and recreational interaction among all members of the university community in such a way as to complement the educational aims of the university." Operating under a board consisting of undergraduate and graduate students, faculty, administrators, and university employees, the union's programming committees present a range of programs including touring professional theater, rock, pop, jazz and classical music concerts, film screenings, art exhibits, major speakers, crafts fairs and more, constituting over 200 performances and presentations each year. In addition the union operates the on-campus television station (Cable 13), FM radio station (WXDU), a film production program and produces and markets the world's first annual college video yearbook. The union also operates craft centers on East Campus and West Campus and coordinates planning and operating policies of the Bryan Center. Union programming committees are open to any member of the Duke community.

**The Mary Lou Williams Center for Black Culture** was dedicated in memory of the "great lady of jazz" and former artist-in-residence whose name it bears. Since its establishment in 1983, the center has served as a significant gathering place on campus where broadly-based issues of social/cultural relevance are addressed to a cross-section of the Duke community. The Mary Lou Williams Center sponsors programs that honor black culture (African-American, South American, Caribbean and African). These programs promote a better understanding of black history and culture. Among past programs have been art exhibits by renowned African-American artists, dance performances, musical performances, African and African-American film, film seminars, and a number of lecture-discussions on various aspects of the black diaspora. Black visiting artists from South Africa and London have performed in the center.

Over the years, the Mary Lou Williams Center expanded its programming from the American Black to include all groups which form the category called "black"—African, Brazilian, European, Caribbean as well as other ethnic and cultural groups. This outreach creates new possibilities for multicultural collaboration and appreciation.

The Admissions Office uses the center as a recruitment site for black students. In the past several years, the center has been used increasingly by faculty, student, and employee groups for meetings, receptions, house courses, lunches, seminars, and social



activities. The atmosphere of the center is designed to inform and create cultural awareness and pride. Visit the website at <http://www.stuaff.duke.edu/deptpages/mlw/index.html>

**The Women's Center.** Located in 126 Few Fed, across the traffic circle from the Allen Building, the Women's Center works to promote the full and active participation of women in higher education at Duke by providing advocacy, support services, referrals, and educational programming on gender-related issues. Women's Center programs and services address a wide variety of issues, including leadership, safety, harassment, health, campus climate concerns, personal and professional development, and the intersection of gender with race, class, and sexual orientation. The center seeks to assess and respond to the changing needs of the university community, to raise awareness of how gender issues affect both women and men on campus, and to serve as an advocate for individuals and groups experiencing gender-related problems, such as sexual harassment or gender discrimination. Duke's office of Sexual Assault Support Services (providing twenty-four hour a day crisis counseling) is also housed in the Women's Center.

The center offers programming internships and work-study jobs to students; houses an art gallery and 3,000 volume feminist lending library; and publishes VOICES, a semesterly magazine addressing issues related to gender, ethnicity, and sexual orientation on campus and in the wider community. Additionally, the center advises and serves as a meeting place for student groups addressing gender issues on campus, including the Women's Coalition, BASES (a student-to-student mentoring program for first-year women), GPWN (Graduate and Professional Women's Network), WISE (Women in Science and Engineering), DARE (Duke Acquaintance Rape Education), and the Panhellenic Council. Open Monday through Friday, 8:30 a.m.-5:00 p.m., the center invites students to study in its lounge or browse through its library during business hours and makes its space available for student group meetings and programs in the evenings. Call 684-3897 for more information or visit our website at <http://www.stuaff.duke.edu/deptpages/womenscenter/index.html>

**International House.** International House serves as the center of co-curricular programs for internationals and U.S. Americans interested in other cultures and peoples. As part of the Division of Student Affairs, the mission of International House is: (1) to assist internationals and their families with orientation and acclimation, (2) to enhance cross-cultural interaction through programming and community outreach; and (3) to provide advocacy and support for the Duke international community. In 1997/98 there were over 1,100 international students from 100 countries enrolled at Duke. Programs include: an intensive orientation program at the beginning of the academic year; the International Friends Program which pairs internationals with local families to promote friendship and cross-cultural learning; Duke Partners which pairs internationals with U.S. Americans for weekly conversation and language exchange; Speakers' Panorama which arranges for internationals at Duke to present their countries to local organizations and schools; World Game, a half-day experiential program which simulates the structure of global problems, resource distribution, and political connections on a world map the size of a basketball court; Friday Coffee Hours (held at noon in the basement of Duke Chapel) a time for people of all nations to come together for refreshments and conversation; Cross-Cultural Training for groups interested in developing awareness and skills needed to manage cultural diversity at both interpersonal and organizational levels; and the International Association, a student-run group which sponsors culture nights, trips, sports teams, and an annual campus-wide International Festival. For more information, contact Carlisle Harvard, Director, 919-684-3585, Box 90417, Durham, NC 27708 or e-mail: [ihouse@acpub.duke.edu](mailto:ihouse@acpub.duke.edu), or on the web: [www.stuaff.duke.edu/deptpages/ccd/I-house/](http://www.stuaff.duke.edu/deptpages/ccd/I-house/)

**Office of Intercultural Affairs.** The Office of Intercultural Affairs (OIA) has responsibility for identifying and assisting with changes in the Duke University community which promote optimum growth and development for African-American, Asian-American, Latino-American, and Native American undergraduate and postbaccalaureate students. The office conducts such activities as public forums on student life, mentorship projects with university alumni, seminars on current issues for students of color, institutional research on development of students of color, and serves as a resource on issues of students of color for the university community.

**The Community Service Center.** The Community Service Center is a clearinghouse for the numerous volunteer and community service activities available to students, faculty, and employees. Through the center, members of the Duke community can become involved with student service groups and Durham area agencies doing everything from tutoring and mentoring, helping to care for people with AIDS, and serving meals at local homeless shelters, to befriending senior citizens and earning work-study money in any of over seventy community service internships. The Community Service Center also sponsors speakers, special events, training sessions, and many other programs. In these ways, the center strives to raise awareness about contemporary social issues, to provide opportunities for students to link their service work and coursework, and to be a catalyst for creative partnerships between Duke University and the wider community. Visit the center's website at [www.stuaaff.duke.edu/deptpages/ccd/commsserv/](http://www.stuaaff.duke.edu/deptpages/ccd/commsserv/)

**The Center for Lesbian, Gay, Bisexual, and Transgender Life.** The mission of the Center for Lesbian, Gay, Bisexual, and Transgender Life (Center for LGB Life) is to provide education, advocacy, support, and space for lesbian, gay, bisexual, transgender, and questioning students, staff, and faculty at Duke, as well as members of neighboring communities. Questioning persons include anyone interested in issues of sexual orientation and gender identity. The center does not discriminate based on sexual orientation or gender identity. Among its many purposes, the center offers: 1) a safe haven to discuss issues of sexuality as they relate to self, family, friends, and others; 2) a friendly and comfortable location for lesbians, gays, bisexuals, transgender persons and allies to socialize and discuss issues affecting the community; 3) a place for groups to meet and organize activities; 4) a resource center and library containing magazines, books, and information by, for, and about lesbians, gays, and bisexuals and transgender persons; 5) advocacy on lesbian, gay, bisexual, and transgender matters at Duke; and 6) a broad array of co-curricular, educational programming aimed at diverse audiences in and around the university. Through these services, the Center for LGB Life presents opportunities for people to challenge intolerance and to create a more hospitable campus climate.

## Student Organizations

**Duke Student Government.** The Duke Student Government (DSG) is the voice of the undergraduate student body of Duke University. DSG is responsible for articulating undergraduate student thought on issues relevant to the university and for working to improve the educational process and university environment. The working philosophy of DSG is that students have the right to participate in the university's decision-making process on matters that affect the student body. Coordinating the efforts of individuals and organizations, DSG lobbies university administrators on practices and policies which govern all facets of life at Duke.

The cabinet is responsible for generating ideas and for the coordination of the organization. It consists of the president, five vice-presidents (executive, student affairs, academic affairs, facilities/athletic affairs, and community interaction), the Student Organizations Finance Committee (SOFC) chair, chief of staff, president pro-tempore,

attorney general, chief justice, public relations directors, director of student services, treasurer, and undergraduate computing directors. The cabinet also includes directors of DSG services, DSG computing, special projects, and university services, and executive legislative secretary, executive cabinet secretary, and head line monitors.

The DSG legislature is composed of 50 representatives from the undergraduate living groups on campus, representatives of students living off campus, and at-large representatives selected from the entire student body. Position statements and policies are initiated and debated through this body. Representatives then return to their constituencies to discuss the issues at hand. Within the legislative body, there are five standing committees which focus more closely on specific issues and projects. Every representative is required to participate on at least one standing committee. The SOFC is the only committee elected from the DSG legislature. The SOFC serves as both an appropriations and advisory committee for student-run organizations. It is responsible for presenting recommendations to the legislative body for the allocation of the student activities fee to various chartered student organizations, as well as recommending allocations from the DSG programming fund to university recognized groups.

DSG offers the opportunity for students to have input in university development through the legislature, through university-wide committees, and through many unique student services. DSG's services seek to aid every undergraduate during his or her Duke career. These services include free legal advice, check cashing service, shuttle services to Durham and Chapel Hill, line-monitoring of basketball and football games, and a computerized ride-rider service.

**Cultural and Social Organizations.** The scope of the more than three hundred student organizations is suggested by a partial listing of their names: Alpha Phi Omega service fraternity, Black Student Alliance, Baptist Student Union, Cheerleaders, International Association, Duke Ice Hockey, Outing Club, Sailing Club, Model United Nations Club, Photography Group, and the N.C. Rural Health Coalition. Sixteen National Interfraternity Council fraternities and ten National Pan-Hellenic sororities are represented on campus as are four fraternities and three sororities governed by the National Pan-Hellenic Conference.

Many opportunities are provided on campus in the areas of music and drama. The Chorale, Modern Black Mass Choir, Chapel Choir, Wind Symphony, Marching Band, Symphony Orchestra, and Collegium Musicum are examples of musical organizations. Duke Drama provides opportunities for non-drama majors to perform established and experimental drama; Hoof 'n' Horn presents musical comedy; Karamu performs drama related to the black experience.

Several academic departments sponsor organizations and programs for students with special academic or professional interests. There are over twenty academic department majors unions on campus. There are also academic and leadership honorary societies.

**Media.** *The Chronicle*, the campus newspaper, publishes five issues weekly and is governed by the *Chronicle* board. A humor magazine (*Carpe Noctem*), a literary magazine (the *Archive*), a feature magazine (*Tobacco Road*), a science magazine (*Vertices*), a photography magazine (*Latent Image*), Duke's black literary publication (*Prometheus Black*), a journal of campus opinion (*Open Forum*), *Eruditio*, a social science journal, and *Blind Spot*, a journal of science fiction and horror-inspired creative works are published on a regular basis by students. In addition, the *Duke Women's Handbook*, the Course Evaluation OnLine, an objective analysis of undergraduate courses, and a comprehensive yearbook, the *Chanticleer*, are produced each year. These publications are under the direction of the Undergraduate Publications Board, which chooses the editors and business managers and reviews the financial budgets of all such franchised publications. The *DukEngineer*, the official student magazine of the School of Engineering, appears twice each year and contains articles on technical and



semitechnical topics as well as other matters of interest to the school. *VOICES* magazine, published by the Women's Center, addresses issues of gender, ethnicity, and sexual orientation. Additionally, there are a number of independent publications on a variety of topics published by students and distributed on campus. WXDU 88.7 FM is the student-managed and programmed radio station, broadcasting to the Duke and Durham communities. Duke Union Community Television (Cable 13) is operated by students and produces color television programs that are broadcast throughout the campus on the university cable system. The University Union produces *Yearbook*, Duke's video yearbook.

**Project WILD.** Project WILD (Wilderness Initiatives for Learning at Duke) is a unique student organization which, through the practice of experiential education (learning through doing), attempts to ease the transition period into college for Duke students. Run entirely by students, the program strives to teach self-worth, group awareness, and an appreciation of nature. The program has three primary components. The August Course is a twelve-day backpacking expedition in western North Carolina held prior to orientation. The House Course is taught each spring semester and includes a seven-day expedition. The Ropes Course Program is a two- to four-hour experience for groups or individuals and is available to the university community year round.

## Health, Physical Education, and Recreation

Besides offering a variety of classes (see the chapter "Courses of Instruction"), the Department of Health, Physical Education, and Recreation also sponsors numerous programs for all students in intramurals, sports clubs, and recreation.

The Intramural Sports Program provides an opportunity for every student to participate in organized recreation competition in forty-nine activities. The program is comprised of four major areas: men's intramurals, women's intramurals, co-rec intramurals, and recreation programs. It is open to all graduate, professional, and undergraduate students of Duke University. Participation, not skill, is a major factor that is emphasized in the program.

More than thirty sports clubs have been chartered by Duke students for those with similar interests to participate in competition and recreational activities. Clubs vary from those which compete with clubs of other universities, such as soccer, rugby, and ice hockey, to those of a more recreational nature such as cycling, and sailing, and one which yearly presents several performances, the water ballet club.

The university's many recreational facilities, available to all students, include the championship Robert Trent Jones Golf Course, tennis courts (some lighted) on both campuses, indoor swimming pools on East and West campuses, and an outdoor pool on central campus, three gymnasiums, including the Brenda and Keith Brodie Recreation Center on East Campus, several weight training rooms, squash and racquetball courts, outdoor handball and basketball courts, an all-weather track, numerous playing fields, jogging trails, and informal recreational areas. Tournaments in recreational sports are often organized and conducted by students. Students may reserve facilities and equipment at designated times.

## Intercollegiate Athletics

The Athletic Department fosters intercollegiate athletics by striving for excellence and by providing the best possible framework within which highly accomplished student athletes can compete. The department has a dual responsibility to provide a high-quality athletic program and environment so that all students have the opportunity to compete to the fullest extent of their abilities. Duke is a member of the National Collegiate Athletic Association (NCAA) and the Atlantic Coast Conference (ACC). The ACC consists of Clemson, Duke, Florida State, Georgia Tech, Maryland, North Carolina at Chapel Hill, North Carolina State, Virginia, and Wake Forest.



The intercollegiate program for men includes football, soccer, basketball, cross country, swimming, fencing, wrestling, indoor and outdoor track, baseball, golf, tennis, and lacrosse. The women's athletic program provides intercollegiate competition in basketball, fencing, field hockey, golf, lacrosse, soccer, swimming, tennis, volleyball, indoor and outdoor track, and cross country. Freshmen may participate on all varsity teams.

The director of athletics and associate director of athletics provide departmental leadership and coordinate all athletic policies with the University Athletic Council. The council consists of representatives from the undergraduate student body, the faculty, the administrative staff, the trustees, and the alumni. The council meets with the director of athletics periodically during the school year. The chairman of the council is the official university representative at national and conference athletic meetings.

## Duke University Undergraduate Honor Code

An essential feature of Duke University is its commitment to integrity and ethical conduct. The honor system at Duke helps to build trust among students and faculty and to maintain an academic community in which a code of values is shared. Instilling a sense of honor, and of high principles that extend to all facets of life, is an inherent aspect of a liberal education.

As a student and citizen of the Duke University community:

I will not lie, cheat, or steal in my academic endeavors.

I will forthrightly oppose each and every instance of academic dishonesty.

I will communicate directly with any person or persons I believe to have been dishonest. Such communication may be oral or written. Written communication may be signed or anonymous.

I will give prompt written notification to the appropriate faculty member and to the Dean of Trinity College or the Dean of the School of Engineering when I observe academic dishonesty in any course.

I will let my conscience guide my decision about whether my written report will name the person or persons I believe to have committed a violation of this Code.

I join the undergraduate student body of Duke University in a commitment to this Code of Honor.

## Judicial System and Regulations

Duke University expects and requires of all its students full cooperation in developing and maintaining high standards of scholarship and conduct. Each student is subject to the rules and regulations of the university currently in effect, or which are put into effect from time to time by the appropriate authorities of the university. At the same time, the individual is responsible for decisions and choices within the framework of the regulations of the community, as Duke does not assume *in loco parentis* relationships.

Students, in accepting admission, indicate their willingness to subscribe to and be governed by these rules and regulations. They acknowledge the right of the university to take disciplinary action, including suspension or expulsion, for failure to abide by the regulations or for other conduct adjudged unsatisfactory or detrimental to the university community.

Responsibility for prescribing and enforcing rules and regulations governing student conduct rests ultimately with the Board of Trustees of Duke University and, by delegation, with administrative officers of the university. In the undergraduate schools,

and in the university as a whole, many of these rules have been established over the years by cooperative action between students, faculty, and administrative officers. Representative student organizations, such as student governments and judicial boards, and more recently, community-wide bodies of students, faculty, and administrators, have initiated proposals for policies and rules necessary to assure satisfactory standards in academic and nonacademic conduct. These proposals have been accepted by university officers and have become a substantial, if not all-inclusive, body of rules governing student life at Duke. For current regulations, refer to the *Bulletin of Duke University: Information and Regulations*.

Students in Trinity College of Arts and Sciences and in the School of Engineering constitute an undergraduate community whose members are subject to the Judicial Code of the Undergraduate Community. Violations of the code and its accompanying university regulations by individuals and residential or nonresidential cohesive units are adjudicated before the Undergraduate Judicial Board, composed of representatives of the student body, the faculty, and the academic administration. The Judicial Code of the Undergraduate Community, the constitution of the board, the procedural safeguards, and the rights of appeal guaranteed to students are published in the *Bulletin of Duke University: Information and Regulations* for the undergraduate community.

## **Student Obligations and Requirements**

Students are expected to meet academic requirements and financial obligations, as specified elsewhere in this bulletin, in order to remain in good standing. Certain nonacademic rules and regulations must be observed also. Failure to meet these requirements may result in dismissal by the appropriate officer of the university.

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# *Admission*



## Principles of Selection

James B. Duke, in his Indenture of Trust, requested that "great care and discrimination be exercised in admitting as students only those whose previous record shows a character, determination, and application evincing a wholesome and real ambition for life." Therefore, in considering prospective students, Duke University looks beyond the basic characteristics of academic competence possessed by the majority of applicants. It seeks, regardless of race, color, religion, national and ethnic origin, gender, handicap, sexual orientation or preference, or age, not only evidence of intellectual promise and maturity of judgment, but also a sense of life beyond the classroom. Often, this is expressed in the form of special talents and accomplishments; it is seen consistently in a student's determination to make creative use of the opportunities and challenges posed by Duke University.

## Requirements for Application

As there are occasionally changes in admission policies or procedures after the printing deadline for the *Bulletin of Duke University: Undergraduate Instruction*, candidates are urged to consult the *Bulletin of Duke University: Undergraduate Admission* for specific admissions information, dates, and policies.

### DEGREE STATUS

Although there are no inflexible requirements as to subject matter, students are urged to choose a broad and challenging high school program. Candidates for admission should present a minimum of four years of English and at least three of mathematics, natural sciences, a foreign language, and social studies. Applicants to the School of Engineering are advised to take four years of mathematics and at least one year of physics or chemistry.

All candidates for first-year standing must complete either the College Board SAT-I examination or the American College Test (ACT). Those students who choose to take the SAT-I should also complete three SAT-II exams, including the SAT-II Writing Subject test. Applicants for the School of Engineering should also take any SAT-II test in mathematics (level 1 or 2). Students wishing to continue study or gain course exemption in a foreign language should complete a SAT-II exam in that language. The SAT-I and SAT-II should be taken by October of the senior year for Early Decision and by January of the senior year for Regular Decision.



Students choosing to take the ACT will not be required to submit SAT-I or II scores; however, the ACT will be used for admission only, not for placement or exemption. The ACT should be taken by October of the junior year for Early Decision applicants and by December of the senior year for Regular Decision applicants.

## NONDEGREE STATUS

**Summer Session.** Persons who are or were at the time of leaving their home institutions in good standing in accredited colleges or universities may be admitted for summer study only by the director of the Summer Session.

**Continuing Education.** Admission as a continuing education student at Duke is limited to adults who live in the Triangle area; Duke graduates; persons who will be moving into the area and plan to reside here for a substantial period of time, for family and work reasons; and local high school seniors. These students are given academic counseling by the Office of Continuing Education; they are subject to most of the regulations set forth for degree candidates.

## Application Procedures

### DEGREE STATUS

A *Bulletin of Duke University: Undergraduate Admission* and an application may be obtained from the Office of Undergraduate Admissions, Duke University, Box 90586, Durham, North Carolina 27708-0586. A nonrefundable processing fee of \$60 must accompany the first part of the application. Students who would like to make use of the Common Application are encouraged to do so. The Common Application is generally available in secondary school guidance offices.

A personal interview at Duke is not required for admission; students who find it possible to visit campus, however, may call to request an interview. Area alumni interviews are also available for most applicants when Part I of the Duke application or the Common Application has been filed by the deadline. On-campus interviews cannot be granted from mid-December through May, when applications are under review.

**Regular Decision.** Candidates who wish to enter Duke as first-year students must submit a completed application no later than January 2 of their senior year in secondary school. Decisions are mailed from the university in early April, and accepted candidates are expected to reserve a place in the class by May 1 with a nonrefundable deposit of \$500.

**Early Decision.** Students for whom Duke is a clear first choice may apply for Early Decision. Candidates who apply for Early Decision are required to sign a statement confirming their commitment to enroll at Duke if they are admitted in the Early Decision process and to withdraw applications from other colleges and universities as soon as they learn of their admission to Duke. Students may apply to only one school under a binding Early Decision plan. Duke reserves the right to withdraw the applications of students accepted to other schools under binding Early Decision plans. Secondary school counselors and parents are also asked to sign the Early Decision agreement. Students who are denied admission under the Early Decision program may not reapply for admission under the Regular Decision program.

Students applying for Early Decision should submit a completed application by November 1. The SAT I and II or the ACT examinations should be taken no later than October of the senior year. Early Decision applicants who have not completed their standardized tests may be deferred to Regular Decision. Applicants are notified of their status—admit, defer, or deny—by mid-December. Admitted students pay a nonrefundable deposit of \$500 by January 2. The credentials of candidates who are

deferred are considered along with candidates for Regular Decision. Deferred students are no longer bound by the early decision agreement and are free to accept offers of admission from other colleges and universities.

This plan is designed to give well-qualified students who know Duke is their first choice a means of indicating that commitment to the university and of receiving a decision early enough to eliminate the necessity of applying to several colleges.

**Midyear Admission.** Midyear admission, when offered, allows a limited number of students to begin their college work a semester early or to postpone matriculation for a semester. Midyear applicants are expected to complete all the requirements for fall admission. The application deadline for new candidates is October 15; students will be notified of the decision on their applications by November 15, with the expectation that those who are accepted will reply by December 1 with a nonrefundable deposit of \$500. **Midyear admission is not offered each year and has not been offered during the last several years. Interested candidates should consult the admissions office to see if the program is offered in the coming year.**

**Transfer Admission.** Transfer admission from other accredited institutions may be arranged for a limited number of students each semester. Because the transcript of at least a full year of academic work is preferred by the Admissions Committee, and because transfer students are required to spend their last two years at Duke, most candidates apply to Duke preceding or during their second year of college. Candidates submit official transcripts of all work completed at other accredited colleges, high school records, scores on the SAT I or ACT, and employment records if there has been an extended period of employment since graduation from secondary school, along with completed application forms. See the section on transfer credit in the chapter "Academic Procedures and Information."

September (fall semester) transfer students submit a completed application by April 1, learn of their decisions by May 15, and respond to the university by June 1 with a nonrefundable deposit of \$400, or \$500 if housing is requested. January transfer students submit a completed application by October 15, learn of their decisions by November 15, and reply to the university by December 1.

## NONDEGREE STATUS

**Summer Session.** Application forms and schedules of courses may be obtained by writing or calling the Office of the Summer Session, Box 90059, Duke University, Durham, North Carolina 27708-0059, (919) 684-2621. No application fee is required.

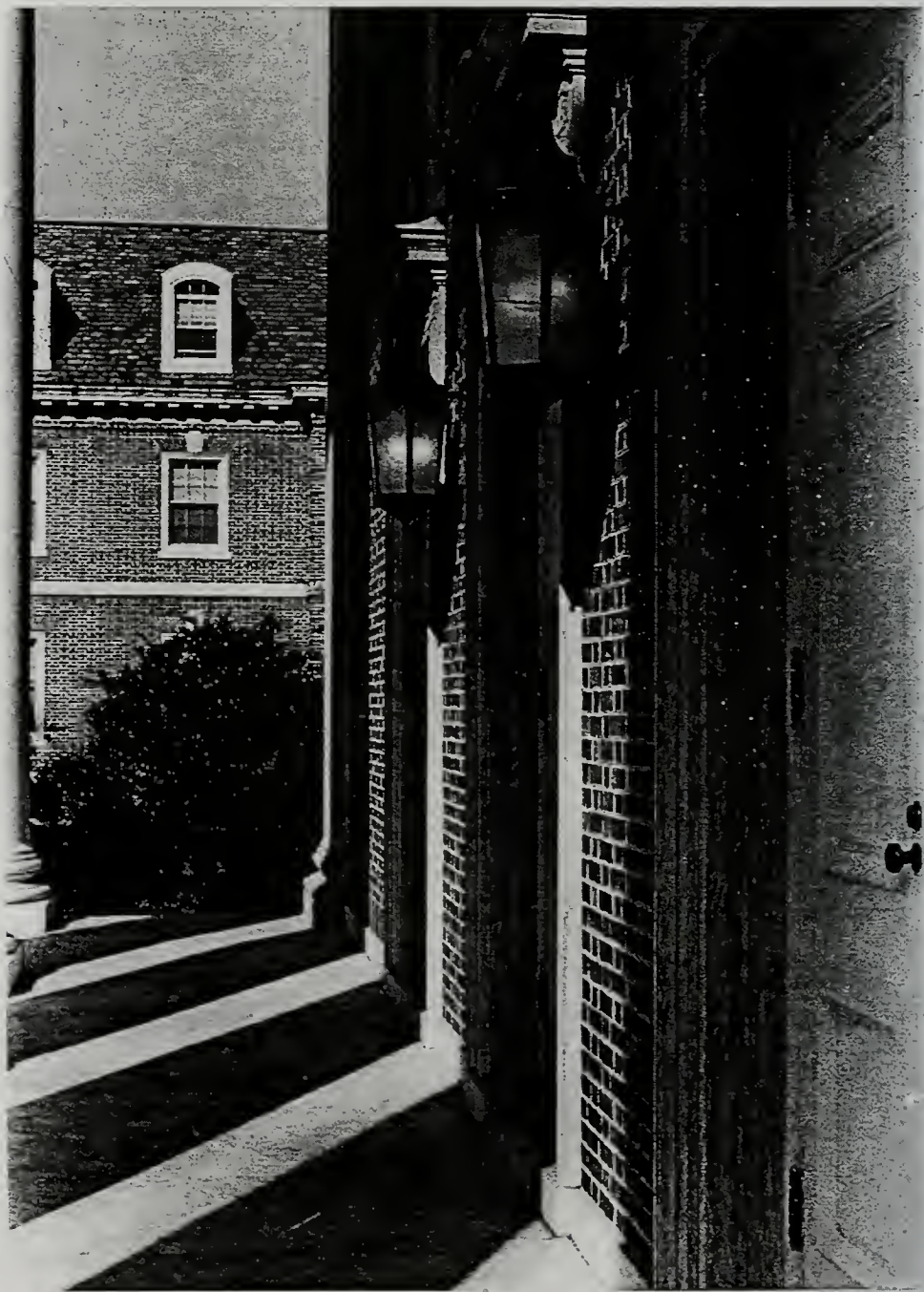
**Continuing Education.** Applications may be obtained from the Office of Undergraduate Admissions and must be returned to that office, accompanied by a \$35 application fee, by August 1 for the fall semester and by December 1 for the spring semester.

A certain grade point average over four courses must be attained before a nondegree student may apply for degree candidacy. More detailed information on nondegree course work through Continuing Education is available from the Office of Continuing Education, Box 90700, Duke University, Durham, North Carolina 27708-0700.

## READMISSION OF FORMER STUDENTS

A student who desires to return, following withdrawal from college, should apply directly to the appropriate college or school. (See the section on readmission procedures in the chapter "Academic Procedures and Information.")

## *Financial Information*





## Tuition and Fees\*

No college or university can honestly state that an education at the college level is inexpensive. Fees paid by students cover less than half the cost of their instruction and the operation of the university. Income from endowment and contributions from alumni and other concerned individuals meet the balance and assure each student the opportunity to pursue an education of unusually high quality.

Students are urged to give their attention first to the selection of institutions which meet their intellectual and personal needs, and then to the devising of a sound plan for meeting the cost of their education. This process will require an in-depth knowledge of both the university's financial aid program and the resources of the student's family. A brochure describing in detail the various forms of financial aid may be obtained from the Office of Undergraduate Financial Aid, Box 90397, Duke University, Durham, North Carolina 27708-0397.

**Estimated Expenses\*.** The figures in this section are projections and are subject to change. Certain basic expenditures, such as tuition, room, and board, are considered in preparing a student's budget. These necessary expenditures, with a reasonable amount allotted for miscellaneous items, are shown below:

|   | <i>Academic Year, 1998-1999</i><br>(two semesters) | <i>Two Summer Terms, 1998</i><br>(one semester equivalent) |
|---|--|--|
| <b>Tuition</b>  |  |  |
| Trinity College   | \$22,410   | \$6,240-7,280  |
| Engineering   | \$23,310   | \$6,240-7,280  |
| <b>Residential Fee</b>                                    |  |  |
| Single Room   | \$4,876-5,847                                      |  |
| Double Room   | \$3,678-4,410                                      | \$967  |
| Triple Room   | \$3,284-3,937                                      |  |
| <b>Food (projections include a meal plan service fee)</b> |  |  |
| 100% board plan   | \$3,560  | \$1,230**  |
| 75% board plan  | \$3,050  | \$ 750**   |
| Books and Supplies  | \$ 750   | \$ 350   |
| Student Health Fee  | \$ 430   | \$ 138   |
| Recreation Fee***   | \$ 100   |  |

It should be realized that additional expenses will be incurred which will depend to a large extent upon the tastes and habits of the individual. The average Trinity College student, however, can plan on a budget of approximately \$32,030. The budget estimate for the summer (two terms, one semester equivalent) is \$8,925. These budgets represent most student living expenses except for cable, telephone, parking, travel costs, and major clothing purchases.

**Registration Fees and Deposits for Fall and Spring.** On notification of acceptance, students are required to pay a nonrefundable first registration fee of \$40, a one-time transcript processing fee of \$30, and to make a deposit of \$430. The deposit will not be refunded to accepted applicants who fail to matriculate. For those who do matriculate \$100 of the deposit serves as a continuing residential deposit for successive semesters, and the remaining \$330 serves as a continuing registration deposit.

**Late Registration.** Continuing students who fail to register during the registration period must pay a fee of \$50 to the bursar.

**Part-Time Students.** In the regular academic year, students who with permission register for not more than two courses in a semester will be classified as part-time students. Part-time students will be charged at the following rates: one course, \$2,803 (engineering, \$2,914); half course, \$1,401 (engineering, \$1,457); quarter course, \$701 (engineering, \$728). Registration for more than two courses requires payment of full

\*The figures in this section are projections and are subject to change.

\*\*These estimates are for use with debit accounts.

\*\*\*This fee applies to students matriculating Fall 1996 and after.





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|   | <i>Academic Year, 1999-2000</i><br><i>(two semesters)</i> | <i>Two Summer Terms, 1999</i><br><i>(one semester equivalent)</i> |
|---|---|---|
| Tuition   |   |   |
| Trinity College                                       | \$22,410  | \$6,240-7,280   |
| Engineering   | \$23,310  | \$6,240-7,280   |
| Residential Fee                                       |   |   |
| Single Room   | \$4,876-5,847   |   |
| Double Room   | \$3,678-4,410   | \$967   |
| Triple Room   | \$3,284-3,937   |   |
| Food (projections include<br>a meal plan service fee) |   |   |
| 100% board plan                                       | \$3,560   | \$1,230 <sup>†</sup>  |
| 75% board plan  | \$3,050   | \$ 750 <sup>†</sup>   |
| Books and Supplies                                    | \$ 750  | \$ 350  |
| Student Health Fee                                    | \$ 430  | \$ 138  |
| Recreation Fee <sup>‡</sup>                           | \$ 100  |   |

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**Late Registration.** Continuing students who fail to register during the registration period must pay a fee of \$50 to the bursar.

**Part-Time Students.** In the regular academic year, students who with permission register for not more than two courses in a semester will be classified as part-time students. Part-time students will be charged at the following rates: one course, \$2,803 (engineering, \$2,914); half course, \$1,401 (engineering, \$1,457); quarter course, \$701 (engineering, \$728). Registration for more than two courses requires payment of full

\*The figures in this section are projections and are subject to change.

<sup>†</sup>These estimates are for use with debit accounts.

<sup>‡</sup>This fee applies to students matriculating Fall 1996 and after.

tuition. Graduate students registered for undergraduate courses will be assessed three units for nonlaboratory courses and four units for laboratory courses. Men and women in nondegree programs who are being considered for admission to degree programs, as designated by the Office of Continuing Education, pay fees by the course whether the course load is one, two, or three courses.

Auditing one or more courses without charge is allowed for students paying full fees, provided that the consent of the instructor is obtained. Students who are enrolled for one or two courses may audit other courses by payment of \$280 for each course audited. With the consent of the appropriate instructor and the director of Continuing Education, graduates of Duke may audit undergraduate courses for the above payment per course.

**Payment of Accounts for Fall and Spring.** The Office of the Bursar will issue invoices to registered students for tuition, fees, and other charges approximately four to six weeks prior to the beginning of classes each semester. The *total amount due* on the invoice is payable by the invoice late payment date which is normally one week prior to the beginning of classes. Inquire at the bursar's office, (919) 684-3531, if an invoice has not been received three weeks prior to the first day of classes, so that payment can be forwarded while a duplicate invoice is issued to document the balance owed. As part of the admission agreement to Duke University, a student is required to pay all invoices as presented. If full payment is not received, a late payment charge as described below will be assessed on the next invoice and certain restrictions as stated below will be applied. Failure to receive an invoice does not warrant exemption from the payment of tuition and fees nor from the penalties and restrictions. Nonregistered students will be required to make payment for tuition, fees, required deposits, and any past due balance at the time of registration.

**Monthly Payment Option.** The Monthly Payment Option Plan allows students and their parents to pay all or part of the academic years expenses in ten equal monthly payments from July 1 to April 1. The only cost is an annual, nonrefundable fee of \$95. The participation fee can be paid by Visa or Mastercard. Payments may be made by check or by bank draft. Questions regarding this plan should be directed to Tuition Management Services, 1-800-722-4867 or 401-849-1550. At renewal, the plan can be extended to twelve months. The monthly payments can be increased or decreased without additional cost.

**Late Payment Charge.** If the total amount due on an invoice is not received by the invoice late payment date, the next invoice will show a penalty charge of 1 1/4 percent per month assessed on the past due balance regardless of the number of days past due. The past due balance is defined as the previous balance less any payments and credits received on or before the late payment date and also any student loan or scholarship memo credits related to the previous balance which appear on the invoice.

**Restrictions.** An individual will be in default if the total amount is not paid in full by the due date. A student in default will not be allowed to register for future semesters, to receive a transcript of academic records, have academic credits certified, or receive a diploma at graduation. In addition, an individual in default may be subject to withdrawal from school and have the account referred to a collection agency.

**Fees for Study Abroad.** Students who register to study abroad on programs administered by institutions other than Duke University will pay the tuition and fees of the administering institution. There will be a fee of \$1,650 per semester, or \$825 per each summer session, payable to Duke University to maintain a student's enrollment at Duke.

**Fees for Courses.** Additional fees are charged for certain physical education activity and applied music courses. For specific charges, consult the Office of the Bursar.

**Tuition and Fees for Summer Session.** Tuition for undergraduates is \$1,620 for each 3 semester hour (s.h.) course, \$2,160 for each 4 s.h. course, \$1,080 for each half course (2 s.h.), and \$3,240 for each one and one-half course program (6 s.h.) offered at the Marine Laboratory.

Tuition for graduate students taking an undergraduate course is as indicated above.

**Health Fee.** All Duke students and all full-time non-Duke students are required to pay \$69 per term. All students at the Marine Laboratory are required to pay \$58 per five-week registration period.

**Music Fee.** A fee of \$152 will be charged for Music 81 and 85. A fee of \$305 will be charged for Music 91 and 95. A fee of \$80 will be charged for Music 79.

**Auditing Fees.** With permission of the instructor, students registered for a full course program (two courses) may audit one nonlaboratory course except a physical education and dance activity course, a studio art course, an applied music course, and foreign programs. No extra charge is made.

Students carrying less than a full course program may be granted permission by the instructor to audit a course (the above exceptions apply) but must pay half the university fee (\$810.00) for the course if it is in Arts and Sciences. Professional school course audit policies may differ.

**Payment of Tuition and Fees.** The university does not mail statements in time to meet summer session tuition deadlines. All summer tuition and fees (which students must calculate from the information above) and any past due balance should be paid in the Office of the Bursar (101 Allen Building) at least five full working days prior to the beginning of the term (see Summer Session calendar). Students paying by mail may forward payment to the Office of the Bursar, Box 90035, Duke University, Durham, North Carolina 27708-0035. Students who fail to pay tuition and fees and/or otherwise fail to clear with the bursar by the end of the drop/add period may be withdrawn from their courses. These withdrawn students will be billed the health fee and an administrative withdrawal fee of \$150 per course (\$75 per half-course) for which they were registered. (See the section on Refunds and Administrative Withdrawal Charges concerning penalties in this chapter). Students who, subsequent to withdrawal, clear with the bursar may, with written permission of their academic dean, be reinstated in their classes as originally registered. The administrative withdrawal fee will stand and the student will be liable for full tuition and fees. Students who are unable to meet these deadlines should consult with the bursar and their academic dean prior to the deadline.

**Transcripts.** Requests for transcripts of academic records should be directed to the associate registrar. Ten days should be allowed for processing. Transcripts may be withheld for an individual whose student loan account is past due.

**Duke Employees.** With the permission of their supervisors, employees may, through the Office of Continuing Education and Summer Session, take up to two courses for credit or audit during any one semester or one during a summer term. A formal application for credit course work must be submitted by August 1 for the fall semester or December 1 for the spring semester. No formal application is required for auditing. Half-time employees with one or more years of service who receive permission to take such courses will be charged one-half the tuition rate shown above for part-time students during the fall and spring and one-half of the summer tuition rate. This benefit applies only to nondegree work. Full-time (thirty or more hours a week) employees with two or more years of service who receive permission to take such courses will be charged one-tenth the tuition rate for credit course work and will be permitted to audit at no charge. This benefit continues after degree candidacy has been attained. Eligible employees should consult the Benefits Office, 705 Broad Street (919) 684-6723, at least one week in advance of payment date to obtain the appropriate tuition voucher. The director of Continuing Education and Summer Session is available to advise Duke employees on educational matters (919) 684-2621.



## Living Expenses\*

**Housing for Fall and Spring.** In residence halls for undergraduate students the housing fee for a single room ranges from \$4,876 to \$5,847 for the academic year; for a double room, the fee ranges from \$3,678 to \$4,410; for a triple room, the fee ranges from \$3,284 to \$3,937 per occupant. Apartment rates for upper-class students range from \$2,971 to \$3,711 per occupant.

Detailed information concerning the student's obligations under the housing contract and the consequences of failure to comply are published in the Bulletin of Duke University: Information and Regulations.

**Housing for Summer.** For detailed information on types and costs of accommodations available at Duke University for the Summer Session write: Department of Housing Management, 218 Alexander Avenue, Apartment B, Durham, North Carolina 27705.

**Food and Other Expenses.** Duke Dining Services and Duke University Stores operations are located on campus to serve the needs of the Duke community. The university identification card, known as the DUKECARD, can be used to gain access to prepaid accounts and make purchases in many Duke University facilities.

The first-year student dining program is a hybrid plan that includes twelve prepaid meals per week at The Marketplace at East Union; plus dining plan debit account "points" for use at any of four cafeterias, six fast food locations, two restaurants, three coffee bars, three convenience stores, concessions at athletic events, sodas and snacks from vending machines, and late night pizza and sub delivery from ten local commercial vendors. The cost of the First Year Plan is \$1,165 per semester for the twelve-meal plan plus one of three "points" plans (Plan G-I) which range from \$435 to \$550. Participation in the First Year Plan is required of all first-year students who reside on East Campus.

Upper-class students who live in the residence halls are required to participate in one of five dining plan debit accounts which allows access to all dining services. The five plan levels (Plan A - Plan E) range from \$1,150 to \$1,780 per semester. Upper class students who live in Central Campus apartments are also required to participate in the dining plan, but may choose to do so at the lower minimum requirement of Plan J (\$820 per semester).

Nonresident students are not required to participate in the dining plan; however, Plan F at a cost of \$395 per semester is offered as an option.

An optional summer dining plan is provided in three plan levels ranging from \$160 to \$615 per summer term.

Students may also purchase a Flexible Spending Account (FLEX) which can be used to purchase any goods or services from Dining Services, Duke Stores, and other campus operations. FLEX is optional and may be opened with a minimum balance of \$25. Additional funds may be deposited to either the FLEX or dining plan debit account at any time.

Information regarding these accounts is sent to matriculating students. For more information about campus retail and food facilities, see the chapter "Campus Life" in this bulletin.

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\*The figures contained in this section are projections and are subject to change prior to the beginning of the fall 1998 semester.

## Fall and Spring Refunds

In the case of withdrawal from the university, students or their parents may elect to have tuition refunded or carried forward as a credit for later study according to the following schedule:

| Withdrawal                          | Refund      |
|-------------------------------------|-------------|
| Before classes begin                | Full Amount |
| During first or second week         | 80 percent  |
| During third, fourth, or fifth week | 60 percent  |
| During sixth week                   | 20 percent  |
| After sixth week                    | None        |

Tuition charges paid from grants or loans will be restored to those funds on the same pro rata basis and will not be refunded or carried forward. In the event of death, a full tuition, fees, and residence hall refund will be granted. In case of a call to military service, a full semester's tuition, full purchase price of textbooks from the university's book store, and the pro rata amount of the room charge will be refunded. The outstanding balance of the food service plan will be refunded in case of military service or death.

In the case of dropping special fee courses (e.g., music, art, golf), or of part-time students dropping audit courses, a full refund will be granted students during the drop-add period. Students changing status to part-time are required to request permission at the time of preregistration; therefore, no refunds are granted during the drop/add period or subsequently for changes which involve carrying less than a full-time load.

The registration deposit will be refunded to students whom the university does not permit to return, who graduate, or who request the refund prior to registration, thereby indicating their intention not to return for the following semester. The registration deposit will not be refunded to students who register for the following semester but fail to enter. Arrangements for refund of the \$100 residential deposit are described in the housing contract.

The remaining balance is any registration deposit applicable to a graduated student who did not reside on campus in the semester preceding graduation will be refunded within four weeks following graduation. The remaining balance of both housing and registration deposits applicable to a graduated student who did reside on campus in the semester preceding graduation will be refunded within seven weeks following graduation.

Because Duke University participates in the Title IV federal aid programs, it follows federal guidelines with respect to the refund and repayment of these funds. All first-time students who withdraw within 60 percent of the enrollment period will have their charges and financial aid adjusted according to the federal regulations. Additional information regarding this procedure may be obtained from the Office of Financial Aid.

## Summer Administrative Withdrawal Charges and Refunds\*

*Drop or Administrative Withdrawal Charges.* Students who will not be attending a summer term or course for which they have registered (i.e., have scheduled a course through the telephone registration system) must officially drop the course(s) prior to the beginning of the term whether or not they have paid tuition and fees. (See the section on course changes for the summer term in the chapter "Academic Procedures and Information.") Students who fail to drop the course(s) prior to the beginning of the term will be charged \$150 per course (\$75 per half-course or audit registration).

*Refunds (Except Foreign Programs).* Students who will not be attending a summer term or course for which tuition and fees have been paid are eligible for refunds following these policies:

1. There is a financial obligation of full tuition and fees if the student drops a course(s) or withdraws from the term after the third day.
2. There is a financial obligation of \$150 per course (\$75 per half-course) if the student officially drops a course(s) or withdraws from the term during the first three days.

The health fee is not refunded. (There is no charge for drop/adds that result in no change in course load in the same term.)

3. Full tuition and fees are refunded if the student officially drops a course(s) or withdraws from the term before the first day.

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\*This policy does not apply to foreign program students.

## Student Aid

Duke University is strongly committed to its financial aid program and, for the four years of undergraduate enrollment, will meet 100 percent of the demonstrated need of each eligible admitted student. The university's aid program includes both merit and need-based scholarships, work-study, the Federal Pell Grant Program, the Federal Perkins Loan, and the Federal Stafford Student Loan Program. Because admissions decisions are made without reference to a student's application for aid, students needing assistance are strongly encouraged to apply for financial aid at the same time as for admission. Students awarded financial aid will be notified at the same time that they are offered admission.

For the student with demonstrated need, the net cost of an education at Duke University will generally be no greater than that for attendance at any private college or university. It is the intention of the Office of Undergraduate Financial Aid to set each award at a level consistent with a family's ability to meet the costs of attending Duke University. This will be done by taking into consideration the contribution that can reasonably be expected from the student, the family, and any available outside sources. During the current academic year, over 40 percent of the student body receives more than forty-nine million dollars in aid of various types.

**Financial Aid for Entering Freshmen.** Candidates should initiate their application for financial aid concurrently with their application for admission. Instructions outlining the specific requirements and deadline dates will accompany application materials. To receive institutional funds, two forms must be submitted, the Free Application for Federal Student Aid (FAFSA) to the federal processor and the PROFILE application to the College Scholarship Service. Students applying for federal loans and grants need to complete only the FAFSA. The custodial parent should submit the PROFILE and FAFSA. The noncustodial parent must submit the Divorced/Separated Parent's Statement. A copy of all pages, including schedules and attachments, of both parents' and student's current federal income tax form must be submitted to the Financial Aid Office on or before May 1. Information provided on the FAFSA PROFILE will be verified through the use of the tax return. Aid will be adjusted as appropriate.

FAFSA and financial aid recipients wishing to operate a motor vehicle on campus must first register it with the Financial Aid Office. As an automobile represents an asset, the value of a financial aid recipient's car will be considered in the estimation of a student's need. As a general rule, a student's annual contribution will be increased by 35 percent of the value of the car.

**Renewal of Financial Aid after the Freshman Year.** Each year students must file an application for renewal of financial aid. This application must include a new PROFILE form, a new Free Application for Federal Student Aid, and a copy of all pages, including schedules and attachments, of the parents' and student's current federal income tax return. Application packets are available in mid-December. The deadline for the receipt of all application materials by the Financial Aid Office is May 1. Failure to meet this deadline will affect the type and amount of aid offered. Applications



submitted after Oct. 15 will be ineligible for fall semester aid. Applications filed after March 15 will be ineligible for spring term aid. All qualified students may receive need-based aid for up to eight semesters. Under certain circumstances consideration will be given to a ninth semester of eligibility.

To have financial aid renewed, a student must meet the continuation requirements outlined in the chapter "Academic Procedures and Information," as appropriate. Students not qualifying for financial aid due to their inability to meet these requirements may appeal directly to the Financial Aid Office. Students holding merit scholarships are required to maintain an average considerably higher than the minimum required for need-based financial aid recipients. Specific details regarding retention standards are outlined on page 106 and will be provided to scholarship winners.

**Summer School Financial Aid.** Limited financial aid is generally available for each summer session. Interested students can obtain specific details as to available funding and an application through the Financial Aid Office in March of each year.

## TYPES OF FINANCIAL AID

Gift scholarships or grants, long-term loans, and employment are integral parts of the financial aid program, and some portion of the aid offered an undergraduate is normally in each of these forms.

The work-study opportunity and loan(s) offered as financial aid are considered to be the self-help portion of the award. The standard aid package at Duke provides that the first \$3,700 to \$6,300 of each student's need be awarded in the form of self-help funds. Funds awarded in excess of this amount will generally be grant funds. This combination of university grant funds and opportunities for self-help enables Duke to extend its resources to a larger number of deserving students.

Duke has a number of scholarships based on merit which are available from personal endowments and corporations. Most are intended for entering freshmen. These scholarships may be based on achievement in a particular field or on an outstanding overall record.

**Gift Scholarships.** The following are among the named gift scholarships offered through Duke University. Where specified, these scholarships are renewable for four (4) years of undergraduate study for those students meeting the following academic standards:

Renewable merit scholarships will be continued for freshmen who complete the first year of studies with a 2.8 average or higher. Upperclass students must complete each academic year with a 3.0 average or higher. Students failing to meet these standards will be placed on probation for one semester during which they must maintain a 3.0 average or higher. Failure to maintain a 3.0 average or higher in subsequent semesters will lead to cancellation of the scholarship. Furthermore, students dismissed from the university for academic dishonesty lose their eligibility for these scholarships should they return to Duke.

**Angier B. Duke Memorial Scholarships.** The Angier B. Duke Memorial Scholarships, competitively awarded on the basis of academic merit, have been established to encourage the intellectual achievement of men and women by recognizing those who possess outstanding academic and leadership abilities. Candidates are selected on the basis of intellectual performance, creative talent, and promise of being eventual leaders in whatever field of endeavor they choose. The scholarship is a four-year program (eight semesters), and a student's continuation in the program is contingent upon good academic performance. All 1997-98 freshman scholarship holders received \$21,550 if enrolled in Trinity College of Arts and Sciences, and \$22,410 if enrolled in the School of Engineering. Students demonstrating additional need will receive a grant from Duke University funds up to the amount needed. All Angier B. Duke Scholars are eligible to participate in a six-week summer study program at Oxford University in England after the junior year. Under the Oxford program the scholarship pays tuition, single room accommodation, full board, designated excursions for all scholars, and an allowance for transatlantic



air fare between New York and London. Those choosing not to participate in the Oxford program are eligible for a \$2,000 grant for an approved independent project. At least one of the four years of the scholarship could be used abroad on an approved program.

*W. N. Reynolds Memorial Scholarships.* Recipients of these awards are students with outstanding ability and/or need who show promise of constructive leadership. In considering candidates for the awards, consideration will be given in the following order: (1) children of employees of R. J. Reynolds Tobacco Company or any of its affiliates or subsidiaries; (2) children of families residing in Forsyth County, North Carolina; and (3) other candidates who are residents or natives of North Carolina. There are a number of awards available for each freshman class with a minimum value of \$500.

*Lionel Hampton Scholarship.* This award of \$500 (not renewable) is given to an incoming freshman who demonstrates high proficiency in a musical instrument and strong potential in jazz performance.

*United Methodist Scholarships.* A number of United Methodist Scholarships are available on a basis of demonstrated need to Methodist students who have given evidence of leadership in their local Methodist Youth Fellowship groups.

*Alice M. Baldwin Scholarships.* One or more of these scholarships, varying in amount from \$500 to \$2,500, are awarded to women who are rising seniors in Trinity College of Arts and Sciences on the basis of scholarship, character, leadership, and need.

*Panhellenic Scholarship.* A scholarship of approximately \$1,000 is awarded to an upperclass woman in Trinity College of Arts and Sciences on the basis of scholarship, character, leadership, service, and need.

*J. A. Jones Memorial Scholarships.* These scholarships, sponsored through the Jones Fund for Engineering, are awarded to engineering students whose outstanding academic and personal qualifications suggest that they will become leaders in a technological society. The awards range from \$1,000 to \$3,000, depending on each recipient's financial need.

*Robert H. Pinnix Scholarships.* The Robert H. Pinnix Scholarships are awarded annually to two upperclassmen enrolled in the Duke School of Engineering. The award is based upon demonstrated ability, excellence in engineering, and financial need.

*Richard Miles Thompson Scholarships.* The Richard Miles Thompson Scholarships are awarded annually to two upperclass students enrolled in the School of Engineering. The awards are based upon academic merit and demonstrated financial need.

*The Mary Duke Biddle Scholarship in Music Composition.* This scholarship with a stipend of up to \$3,500 per year is available to a member of each entering class. It is renewable annually as long as the student meets the required standards for renewal. Students wishing to apply for this award will be required to submit examples of their composition. Eligibility is limited to students planning to major in music.

*The William O'Connor Memorial Scholarship.* This music scholarship of up to \$2,500, established by the Mary Duke Biddle Foundation in honor of William O'Connor and in appreciation for his many years of service to the foundation, is awarded to student of a string instrument or organ.

*The A. J. Fletcher Scholarship.* This music scholarship of \$7,500 is offered annually to an entering first-year student on a competitive basis who can demonstrate, by tape or audition talent and achievement in instrumental or vocal performance, or in the case of composition, a representative portfolio. Recipients are required to declare a major in music and to participate in a departmental ensemble every semester. It is renewable for four years as long as the student meets the required standard for renewal.

*Air Force ROTC College Scholarship Program.* Students can apply for three-year scholarships during their freshman year and two-year scholarships during their sophomore year. Scholarships are available to qualified students who major in most fields, primarily scientific or engineering. The scholarships include tuition, fees, and textbook reimbursement, plus a \$150 per month tax-free allowance.

*Army ROTC Scholarship Program.* All freshman and sophomore students are eligible to apply for Army ROTC scholarships. Awarded without regard to academic major, these grants pay a portion of tuition, fees, and textbook/equipment costs in addition to providing a tax-free monthly stipend of \$150 for the balance of the student's normal period to graduation. Commissioned service, following graduation, can be either on active duty or with the reserve forces as determined by the Secretary of the Army. Additional information concerning Army ROTC scholarships is available from the professor of military science.

*Navy ROTC College Scholarship Program.* This program provides for up to four years' tuition and textbooks, laboratory fees, and a \$100 per month stipend. These scholarships, based upon academic achievement, leadership potential, and overall performance, can be awarded at any stage of the student's college career through either a nationwide selection process or by the professor of naval science at the

university. In addition, two other two-year scholarships are available to rising juniors: one leads to a career in nuclear power, and the other follows a summer attendance at the Naval Science Institute at Newport, Rhode Island. For further information on any of the above scholarship programs, contact the professor of naval science.

*Reginaldo Howard Scholarships.* These scholarships, awarded annually to freshman African-American students, are provided to honor the late Reggie Howard, first black president of the student government. Seven scholarships for \$6,000 are awarded each year. Scholarships are available for the four years of undergraduate study as long as the student maintains the academic average specified for renewal.

*The Anne McDougall Memorial Award.* The Anne McDougall Memorial Award for Women is awarded each year to one woman student studying psychology or a related field. Administered through women's studies, this \$1,000 award is intended to provide encouragement and support for women who wish to pursue academic study and continue in the area of human service.

*The Janet B. Chiang Memorial Scholarship Fund.* This fund was created by the family and friends of Janet B. Chiang. An award is made annually to a student who has demonstrated strong leadership qualities and a strong interest in his or her Asian cultural heritage.

*Emma A. Sheaffer Drama Scholarships.* These scholarships are awarded to talented prospective drama students who would not be able to attend Duke University without financial assistance. Awards shall be made to a single individual or to several qualified students in need, with first preference to students from the New York metropolitan area. Awards range from \$1,000 to \$5,000. Interested incoming students should apply to the director of the program.

*The Steven and Toby Korman Drama Scholarships.* The scholarship shall be awarded annually to a student(s) who has demonstrated exceptional talent and ability in the field. Awards range from \$1,000 to \$5,000. Interested students should apply to the director of the program.

*Kohler Scholarships in Drama.* Several awards each year ranging from \$250 to \$1,000 are given to students active in the Drama Program. Awards are made on a nondiscriminatory basis with regard to color, sex, and religion. Interested students should apply to the director of the program.

*The Beth Gotham Semans Drama Scholarships.* These awards are made annually to currently enrolled undergraduate students who have been and continue to be active in drama, with preference given to African-American and other minority students. Applicants need not be drama majors but must demonstrate significant involvement in dramatic activities. Awards range from \$1,000 to \$2,500; decisions are made by a special committee appointed by the Drama Program.

*Dasha Epstein Scholarship in Playwriting.* This scholarship is awarded to students interested in playwriting. The recipient of this award is chosen by a faculty committee from among applicants to Duke who qualify for financial aid.

*The Roger Alan Opel Memorial Scholarship.* A grant is awarded annually to a Duke student who will spend a year of undergraduate study at a British university. The student is selected on the basis of intellectual curiosity, academic ability, and financial need. The award was established by the parents of Roger Alan Opel, a senior at Duke University who was killed in November, 1971.

*Alumni Endowed Scholarships.* Three \$8,000 per year Alumni Endowed Undergraduate Scholarships are awarded to needy students who demonstrate superior academic ability and leadership potential. These awards are renewable annually for those meeting the stated requirements. Although not restrictive, preference is given to children of alumni.

### Scholarships for North Carolina Residents

*The Benjamin N. Duke Scholarship Fund.* Established by the Duke Endowment to honor Benjamin N. Duke, this fund is intended to encourage the enrollment of students from North Carolina and South Carolina.

*The Benjamin N. Duke Leadership Award.* As part of the Benjamin N. Duke Scholarship Fund, these awards recognize and encourage leadership potential and community involvement of students from North and South Carolina. Ten scholarships, valued at 75 percent of tuition, are awarded annually.

*The Benjamin N. Duke Scholarship Fund* also provides a number of grants which replace up to \$2,000 of what would normally be the loan portion of need-based awards received by students from North Carolina and South Carolina. This fund can allow need-based aid recipients from the Carolinas to graduate with a significantly reduced debt following the eight standard semesters of enrollment.

*Trinity Scholarships.* Awarded to North Carolinians of exceptional ability, these scholarships are named to honor the fact that Duke University was originally named Trinity College. Trinity scholarships provide each winner an award equal to the value of tuition, fees, room, board, and the cost of a summer program.

*North Carolina Math Contest.* Upon enrolling at Duke, the top student finishing in the top ten in the North Carolina Math Contest taken as a high school senior is eligible to receive a scholarship equal to the amount of tuition. This scholarship is available for each of the four years of undergraduate enrollment as long as the student maintains the specified average. Winners must have applied to and been accepted by Duke University.

*The Perry Family Scholarship.* Awarded to students from Winston-Salem and the Forsyth County area, this scholarship, valued at \$5,000, is awarded every other year. Recipients of the scholarship will be required to demonstrate high academic achievement as well as leadership and/or involvement in extracurricular activities. The scholarship is available for four years if the student meets the specified academic requirements.

*J. Welch Harriss Scholarships.* Recipients of these scholarships will receive \$1,000 per year without reference to need. If demonstrated need exceeds \$1,000, then the scholarship will be adjusted accordingly. These awards are made to entering freshmen who have achieved outstanding academic records. They are renewable each year as long as the student maintains the required average. Consideration will be given in the following order: (1) students from High Point, North Carolina; (2) students from Guilford County, North Carolina; and (3) students from North Carolina.

*Allyse Smith Cooper Scholarships.* Each year scholarships of various amounts are awarded to students demonstrating both merit and need. Preference is given to students from Alamance County, North Carolina.

*Braxton Craven Endowed Scholarships.* Recipients of these scholarships will receive an amount equal to the current tuition at Duke. Braxton Craven scholars will be chosen on the basis of outstanding academic and extracurricular achievement and need. First preference is given to students from North Carolina. The scholarships are approved on a continuing basis, provided that the recipient complies with the specified academic requirements.

*The John M. and Sally V. Blalock Beard Scholarship.* These scholarships are awarded annually to outstanding students from the Wake County area of North Carolina who major in English or the history of the United States. These awards are based on financial need, scholarship, character, and academic achievement.

*North Carolina Legislative Tuition Grant.* The North Carolina General Assembly has established a program of tuition grants available to North Carolina residents who are full-time students at private colleges and universities in the state of North Carolina. The grant for each eligible student is approximately \$1,450 per year. Applications will be mailed to all eligible students during the summer. In the case of a need-based financial aid recipient, this grant reduces a student's tuition and therefore his budget. All qualified need-based aid recipients are required to apply for this grant.

*State Contractual Scholarships for Needy North Carolinians.* Funds provided by the state of North Carolina through the Legislative Grant Program are distributed to needy North Carolinians qualifying for the State Contractual Scholarship Program. Application is made through the College Scholarship Service's PROFILE.

**Loans.** The loan programs which are available to students through Duke University are listed below:

*Federal Perkins Loan.* Loan funds supplied by the federal government and Duke University through Part E of Title IV of the Higher Education Act of 1965 are available to qualified students. Repayment of loans under this act normally begins nine months after the student has graduated or leaves college, with complete payment scheduled within a ten-year period. Interest accrues at the rate of 5 percent annually, commencing nine months after the borrower ceases to be at least a half-time student at an institution of higher education. This loan is part of the student's financial aid award.

*Federal Stafford Student Loan Program (Subsidized).* These loans are federally-insured and are available to students through banks and other lending institutions. During enrollment, the interest on subsidized loans is paid by the Federal government. Repayment, available over a ten-year period, begins six months after a student leaves school. Interest is based on the T-Bill rate plus 3.1%, but will not exceed 8.25%. Need, as established by the Federal government's formula will be considered in the University's decision regarding applications. The annual limit on a loan is \$2,625 for freshmen, \$3,500 for sophomores, and \$5,500 for juniors and seniors. Accepted Stafford Loan awards, as indicated on Award Letters, will be processed electronically and guarantors will mail Application/Promissory Note Forms directly to students.

*Federal Parents' Loan for Undergraduate Students Program.* Parents may borrow up to the cost of education less financial aid through the Federal Parent Loan for Undergraduate Students (PLUS) program. Repayment of these loans begins sixty days after loan disbursement. Interest is based upon treasury bill rates but will be no higher than 9 percent and begins to accrue at the point repayment begins. Interested parents should contact their lender or the financial aid office.



**Federal Unsubsidized Stafford Loan Program.** All undergraduate students, regardless of need, are eligible to borrow an Unsubsidized Stafford Loan. The loan limits and the interest rate are the same as for the subsidized Stafford Loan described above. Although repayment of the principal begins six months after the student leaves school, interest payments begin 45 days after the first disbursement of the loan.

**Duke University "Achiever" Loan Program.** Working with the Knight Resource Group, Duke has designed a loan plan that provides families with three approaches to paying for college. These options give eligible parents the choice of creating a two to four year payment plan, an annual plan, or a plan that provides for interest-only payments during the enrollment period. For more information, contact the Knight Group at 1-800-225-6783.

**Share Loans.** "Share" is a supplemental educational loan program developed specifically to help families meet the costs of higher education. Credit-worthy families, regardless of income, may be eligible to borrow through this program. Annual loan amounts range from \$2,000 to up to the cost of education less financial aid. The interest rate is variable, and Share offers several repayment options. For information call 1-800-EDU-LOAN.

**Duke "Signature Select" Program.** This privately-funded loan program is available to all Duke University students. Undergraduates must be at least half-time and must have a credit-worthy co-signor. The Signature Select Program is administered through the Sallie Mae Corporation. Undergraduates may borrow up to \$10,000 per year. Application Forms and information about interest rates and repayment options are available from the Undergraduate Financial Aid Office.

**Children of Methodist Ministers.** Children of ministers in the North Carolina and the Western North Carolina Annual Conferences of the United Methodist Church may be eligible to receive a partial tuition grant of \$750 per semester for a maximum of eight semesters of undergraduate study at Duke University. Eligibility is met by the parent being in a regular pastoral appointment and resident in one of the conferences. When the parent is in a special appointment and resident in one of the conferences, eligibility will be determined on an individual basis, depending upon the nature of the appointment. In all cases the decision of the university will be final.

**Employment.** Most financial aid recipients are offered a job as part of their aid package. The money is paid directly to the student. The Office of Undergraduate Financial Aid maintains part-time employment listings for the campus and surrounding local non-profit organizations. All students interested in working during the school year should review the jobs listing in the Career Development section of the Duke Home Page ([www.duke.edu](http://www.duke.edu)). Every effort will be made to help students find jobs consistent with their interests.

Duke University also expects that students receiving financial aid will work during the summer. In the year before entering college, a freshman should save a minimum of \$1,800 for use during the first year of college. In subsequent years, minimum student earnings will be \$2,100 for sophomores, \$2,200 for juniors, and \$2,300 for seniors. These figures are viewed as estimates and are revised consistent with actual earnings. Duke University offers subsidized employment opportunities to many students not qualifying for need-based financial aid. Interested students must submit the appropriate aid applications.

**Tuition Plans.** Many families finance a college education with the assistance of an insured tuition payment plan regardless of whether they receive financial assistance from Duke. The university is pleased to offer a twelve-month payment plan through Tuition Management Systems. More information can be obtained from the Duke Bursar's Office.



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## *Courses and Academic Programs*



## Definition of Terms

Courses taught in 1996-97 or in 1997-98 or scheduled for 1998-99 are included in this chapter with full descriptions. Additional courses, which were offered prior to 1996-97 and are likely to be taught in the future, are listed separately by number and title only under the heading *Courses Currently Unscheduled*. For courses that will be offered in 1998-99, consult the *Official Schedule of Courses*.

Introductory level courses are numbered below 100; advanced level courses are numbered 100 and above. Courses numbered 1 through 49 are primarily for first-year students; courses numbered from 200 through 299 are primarily for seniors and graduate students. (See the section on course load and eligibility in the chapter "Academic Procedures and Information.")

Double numbers separated by a hyphen indicate that credit is contingent upon completion of both courses. Double numbers separated by a comma indicate that although the course is a year-long course, credit may be received for either course or both courses.

The following symbols, suffixed to course numbers, identify small classes: *S*, seminar; *P*, preceptorial; *T*, tutorial; *D*, discussion section (for a larger class). The *L* suffix indicates that the course includes laboratory experience. *C-L*: denotes a course that is cross-listed or a program under which a course is listed.

The following symbols, suffixed course titles, identify the area of knowledge to which a particular course has been assigned in the curriculum: *AL*, arts and literatures; *CZ*, civilizations; *FL*, foreign languages; *NS*, natural sciences; *QR*, quantitative reasoning; *SS*, social sciences.

The following portion of this bulletin, arranged alphabetically, includes courses of academic departments, programs, sections, and institutes, as well as categories of courses. Details are provided in the individual entries, which indicate whether a major, a minor, and/or a certificate is available in that particular field. (A certificate, offered in some programs, is not a substitute for a major but is a supplement, confirming that a student has satisfied the requirements of that program.)

## Trinity College of Arts and Sciences

Professor Chafe, *Dean of the Faculty of Arts and Sciences and Dean of Trinity College*; Professor Thompson, *Dean of Undergraduate Affairs, Trinity College*; Senior Associate Dean for Administration Wilson (Social Sciences); Associate Deans Bryant (Social Sciences), Nijhout (Natural Sciences), Willard (Academic Planning and Special Projects), and Wittig (Humanities); Assistant Deans Gilbert (Summer Sessions), Johns (Study Abroad), Keul (Pre-Majors), Lattimore (Social Sciences), and Singer (Natural Sciences)

# Aerospace Studies—Air Force ROTC (AS)

Professor Spitzer, Colonel, USAF, *Chair*; Visiting Assistant Professor Evans, Captain, USAF, *Director of Undergraduate Studies*; Visiting Assistant Professors Lass, Captain, USAF, and Runyon, Captain, USAF

**Eligibility Requirements.** All freshmen and sophomores, men and women, are eligible to enroll in the General Military Course in the Air Force Reserve Officer Training Corps. For enrollment in the Professional Officer Course, the student must have completed successfully either the General Military Course and a four-week field training encampment or the six-week field training encampment; must execute a written agreement with the government to complete the Professional Officer Course; must be sworn into the enlisted reserve; and must agree to accept a commission in the U.S. Air Force upon graduation. In addition, each student must take at least one course in mathematical reasoning and English composition prior to graduation/commissioning. Students in the General Military Course and Professional Officer Course are required to attend two hours of leadership laboratory each week. All courses, except 2L, are open to all other students with consent of instructor.

## General Military Courses

### *First Year*

**1. The Air Force Today.** Introduction to the United States Air Force and Air Force ROTC. Topics include: mission and organization of the Air Force, officership and professionalism, military customs and courtesies, Air Force officer opportunities, group leadership problems, and an introduction to communication skills. Laboratory required for AFROTC cadets. (May not be counted to satisfy graduation requirements.) Half course. *Evans*

**2L. Leadership Laboratory.** Instruction in drill and ceremonies, wearing the uniform, giving commands, and other leadership activities. Mandatory for all Air Force ROTC cadets. Must be repeated each semester. Pass/fail grading only. *Staff*

### *Second Year*

**51. The Air Force Way.** A survey course designed to facilitate the transition from Air Force ROTC cadet to candidate. Topics include: Air Force heritage, Air Force leaders, Quality Air Force, an introduction to leadership, group leadership problems, and continuing application of communication skills. Laboratory required for AFROTC cadets. (May not be counted to satisfy graduation requirements.) Half course. *Runyon*

## Professional Officer Courses

All students selected to continue in Aerospace Studies must pursue the following courses.

### *Third Year*

**105S, 106S. Air Force Leadership and Management.** Leadership and quality management fundamentals, professional knowledge, Air Force doctrine, leadership ethics, and communication skills required of an Air Force junior officer. 105S: training philosophy, counseling/feedback, leadership vs. management, leadership principles and perspectives, effective delegation, and written and verbal communication skills. 106S: principle centered/situational leadership, case studies of different leadership styles, ethical behavior, effective management tools to evaluate and improve processes, building and refining written and verbal communication skills from 105S. Laboratory required for AFROTC cadets. One course each. *Lass*



#### *Fourth Year*

**205S, 206S. Preparation for Active Duty.** The national security process, regional studies, advanced leadership ethics, and Air Force doctrine. The military as a profession for active duty, and current issues affecting military professionalism. 205S: American tradition in foreign politics; cold war challenges; the relationship with the president, Congress, and the military; chain of command; Air Force and joint doctrines; national security issues; regional studies; and advanced level briefings and papers. 206S: officership, ethics, military law, Air Force issues, roles and missions, preparation for active duty, and building and refining written and verbal skills from 205S. Laboratory required for AFROTC cadets. One course each. *Spitzer*

#### **COURSES CURRENTLY UNSCHEDULED**

**49S. First-Year Seminar.**

### **African and African-American Studies (AAS)**

Professor Holloway, *Director*; Professors Gaspar, McLoyd, and Payne; Research Professor Giddings; Associate Professors Lubiano and Powell; Assistant Professor of the Practice El Hamel; Lecturer Daniels

A major or a minor is available in this program.

The program in African and African-American Studies provides students with an interdisciplinary approach to the field, within which they may focus on Africa or the Americas. The courses are essential components of a liberal arts education. Ten courses (including a prerequisite course: Introduction to African and African-American Studies) are required for the major; five are required for the minor. A summer study program is available in Zimbabwe/Botswana sponsored by the Department of Political Science.

The African and African-American Studies courses are listed below. (Full descriptions of cross-listed courses may be found in the bulletin course listings of the particular department or program cited in the cross-listing, for example, Music 74.) In addition, Swahili and Arabic language courses are taught in the Asian and African Languages and Literature Program, and other relevant language courses in the Department of Romance Studies.

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**51. Introduction to African and African-American Studies. (CZ)** A general interdisciplinary study providing a broad overview of: African origins and culture, the slave trade both in Africa and the Americas, the antebellum period in the Americas, the struggle for freedom by black people, and the post-1865 period. One course. *Daniels, Lubiano, and Piot*

**70, 71. The Third World and the West. (CZ)** See C-L: History 75, 76; also C-L: Comparative Area Studies, Latin American Studies, and Perspectives on Marxism and Society. One course each. *Staff*

**74. Introduction to Jazz. (AL)** See C-L: Music 74. One course. *Jeffrey*

**90S. Considering Identity Using Fiction and Ethnography. (SS)** See C-L: Cultural Anthropology 90S; also C-L: Women's Studies. One course. *Daniels*

**99. Special Topics.** Topics vary from semester to semester. One course. *Staff*

**99S. Special Topics.** Seminar version of African and African-American Studies 99. One course. *Staff*

**113B. Europe's Colonial Encounter, 1492-1992. (CZ)** See C-L: History 113B. One course. *Thorne*



**114S. Islam in West Africa. (CZ)** The development of Islam with reference to its theological and intellectual aspects in West Africa, beginning with West Africa's first contacts with Islam in the seventh-century Islamic reform movements. The history of kingdoms and empires of West Africa. Focus on the impact of Islam there. C-L: History 114A. One course. *El Hamel*

**115A. History of Africa: From Antiquity to Early Modern Times. (CZ)** Not open to students who have taken the former African and Afro-American Studies 115. See C-L: History 115A; also C-L: Comparative Area Studies, and Women's Studies. One course. *El Hamel or Ewald*

**115B. History of Africa: From Early Modern Times to Independence. (CZ)** Not open to students who have taken the former African and Afro-American Studies 115. See C-L: History 115B; also C-L: Comparative Area Studies, and Women's Studies. One course. *El Hamel or Ewald*

**116. Race and Ethnic Relations. (SS)** See C-L: Sociology 116. One course. *Jackson*

**117. Black Women and the Civil Rights Movement. (SS)** An interdisciplinary examination of the role of African-American women in the modern civil rights movement, including an overview of the movement and its impact on the current political landscape; individual women who were agents of change; and the intersections of race, gender, and class that emerged during this important period of this reform. C-L: Women's Studies 117. One course. *Giddings*

**120. Egyptian Art and Archaeology. (AL)** See C-L: Art History 120; also C-L: Classical Studies 118. One course. *Staff*

**121. Introduction to Asian and African Literature. (AL)** See C-L: Asian and African Languages and Literature 121; also C-L: Comparative Area Studies. One course. *Staff*

**122. Culture and Politics in Africa. (CZ)** See C-L: Cultural Anthropology 122; also C-L: Comparative Area Studies, and Perspectives on Marxism and Society. One course. *Piot*

**123. Modernity, Ethnicity, and Colonization. (AL, CZ)** See C-L: Romance Studies 124; also C-L: Canadian Studies, Comparative Area Studies, and Cultural Anthropology 130. One course. *Mignolo or staff*

**124S. Slave Society in Colonial Anglo-America: The West Indies, South Carolina, and Virginia. (CZ)** See C-L: History 124S; also C-L: Comparative Area Studies. One course. *Gaspar*

**127A. The Caribbean, 1492-1700. (CZ)** See C-L: History 127A; also C-L: Latin American Studies. One course. *Gaspar*

**127B. The Caribbean in the Eighteenth Century. (CZ)** Not open to students who have taken African and Afro-American Studies 127. See C-L: History 127B; also C-L: Latin American Studies. One course. *Gaspar*

**133. History of African-American Social Dance Forms of the Twentieth Century. (AL)** See C-L: Dance 133. One course. *Sommer*

**135S. Diaspora Literacy: Black Women Novelists of the Third World. (AL)** Contemporary fiction of black women writers from West Africa, the Caribbean, and the United States. Representations of cultural and national identities, patterns of language, figurative representations, and the revisioned histories as structured and framed within imaginative literatures. Issues of colonialism and slavery as background. One course. *Holloway*

**136. Black Intellectual History. (AL, CZ)** An interdisciplinary study examining the ways in which black intellectualism is constructed over the group's history in the United States; some

examples of the written and oral output of specific black intellectuals; the terms (social, cultural, and political) under which such output comes into being and comes to be remembered against the larger United States intellectual background. One course. *Lubiano*

**138. Francophone Literature.** (AL, FL) Prerequisite: good knowledge of French. See C-L: French 168; also C-L: Asian and African Languages and Literature 168, Canadian Studies, Comparative Area Studies, and Latin American Studies. One course. *Jonassaint or staff*

**141S. Special Topics in Jazz.** (AL) Also taught as Music 141S. Prerequisite: Music 74 or consent of instructor. One course. *Brothers or Jeffrey*

**142. African-American Music in the Twentieth Century.** (AL) See C-L: Music 142. One course. *Brothers*

**143. Education, Culture, and Identity.** (SS) See C-L: Cultural Anthropology 143; also C-L: Education 143. One course. *Luttrell*

**145A, 145B. African-American History.** (CZ) See C-L: History 145A, 145B. One course each. *Gavins*

**148A. Introduction to Urban Politics.** (SS) See C-L: Political Science 103A. One course. *Orr*

**148B. Urban Poverty and the Urban Underclass.** (SS) See C-L: Political Science 103B. One course. *Orr*

**149. Introduction to African-American Politics.** (SS) See C-L: Political Science 141. One course. *Orr*

**150. Religion and Spirituality in the African Diaspora.** (CZ, SS) Religious examinations of culture and cultural processes in the African Diaspora. Exploring various religious traditions, beliefs, and practices to understand how they are supported by and located within their unique communities of worship. C-L: Cultural Anthropology 150 and Religion 160. One course. *Daniels*

**151. Islamic Mysticism: Arabic (Western) Tradition.** (CZ) See C-L: Religion 152A; also C-L: Comparative Area Studies. One course. *Cornell*

**152. African-American Religion and Identity.** (CZ) See C-L: Religion 154. One course. *Hart*

**156. The Blues Aesthetic: African-American Art in the Twentieth Century.** (AL) See C-L: Art History 176. One course. *Powell*

**158A. New Perspectives on the Atlantic World.** (CZ) See C-L: History 158A; also C-L: Comparative Area Studies. One course. *Ewald*

**160. Women in Islam: Fact and Fiction.** (CZ) See C-L: Asian and African Languages and Literature 190; also C-L: Comparative Area Studies, Religion 139, and Women's Studies. One course. *Cooke*

**161S. Economics of Slavery in the American South.** (SS) Prerequisite: Economics 149. See C-L: Economics 161S. One course. *Staff*

**165. History of the Working Class in the United States.** (CZ) Not open to students who have taken History 106. See C-L: History 165; also C-L: Perspectives on Marxism and Society. One course. *Keyssar*

**166. History of the Sahara.** (CZ) See C-L: History 166. One course. *El Hamel*

**169S. African-American Drama.** (AL) Also taught as English 169S. One course. *Staff*

- 170. Afro-Brazilian Culture and History. (CZ)** See C-L: History 170C; also C-L: Latin American Studies. One course. *French*
- 171. From Apartheid to Democracy in South Africa. (SS)** See C-L: Political Science 171; also C-L: Comparative Area Studies. One course. *Johns*
- 172S. Culture Heroes Across Cultures. (AL)** See C-L: Distinguished Professor Courses 180S; also C-L: Classical Studies 174S. One course. *Davis*
- 173, 174. African-American Literature. (AL)** Not open to students who have taken the former English 167, 168. See C-L: English 164A, 164B. One course each. *Chandler, Clarke, or Holloway*
- 175S. The Southern Plantation as Historical Laboratory: Odyssey in Black and White, 1770-1970. (CZ)** See C-L: History 175S. One course. *Nathans*
- 177. North African Literature in Translation. (AL)** See C-L: Asian and African Languages and Literature 174; also C-L: Comparative Area Studies. One course. *Chergui*
- 181, A-E. Studies in an Individual African-American Author. (AL)** See C-L: English 165. One course. *Chandler, Clarke, Holloway, or Willis*
- 182, A-F. African-American Literary Genres. (AL)** See C-L: English 166. One course. *Chandler, Clarke, Holloway, or Willis*
- 190, 191. Independent Study.** Directed reading and research. Consent of both instructor and director of undergraduate studies required. Open to juniors and seniors. One course each. *Holloway*
- 192, 193. Honors Program Sequence.** Research for the development of honors thesis. Open only to senior majors. Consent of both instructor and director of undergraduate studies required. One course each. *Holloway*
- 194A, 194B. Distinction Program Sequence.** Research for the development of thesis. Open only to senior majors. Consent of both instructor and director of undergraduate studies. One course each. *Staff*
- 197S. The Destruction and Aftermath of Slavery in the Americas: A Comparative Perspective. (CZ)** Also taught as History 195S or 196S. One course. *Staff*
- 198S. Senior Seminar.** Open to seniors majoring in African and African-American Studies and to others with consent of instructor. One course. *Daniels, Lubiano, and Piot*
- 199. Special Topics.** Lecture version of African and African-American Studies 199S. One course. *Staff*
- 199S. Special Topics.** Topics vary from semester to semester. One course. *Staff*
- 200S. Seminar in Asian and African Cultural Studies. (CZ)** See C-L: Asian and African Languages and Literature 200S; also C-L: Cultural Anthropology 288S, and Literature 200S. One course. *Staff*
- 209S. Race, Class, and Gender in Modern British History. (CZ)** See C-L: History 209S; also C-L: Study of Sexualities. One course. *Thorne*
- 216S. Gender, Race, and Class. (SS)** Consent of instructor required. See C-L: Cultural Anthropology 216S; also C-L: Study of Sexualities, and Women's Studies. One course. *Luttrell*
- 233S. Slave Resistance and Social Control in New World Societies. (CZ)** See C-L: History 233S; also C-L: Comparative Area Studies, and Latin American Studies. One course. *Gaspar*

- 235S. **The Antebellum South.** (CZ) See C-L: History 235S. One course. *S. Nathans*
241. **Classical Islamic Theology and Ethics.** (CZ) See C-L: Religion 241. One course. *Cornell*
254. **Justice, Law, and Commerce in Islam.** (CZ) See C-L: Religion 254; also C-L: Law 568. One course. *Cornell*
255. **Anthropology as Public Discourse.** (SS) See C-L: Cultural Anthropology 255. One course. *Baker or Strauss*
- 264S. **Poverty and Social Policy: Life Course Human Resource Development.** (SS) Also taught as Public Policy Studies 264S.46. One course. *Staff*
- 270S. **Topics in African Art.** (AL) Consent of instructor required. See C-L: Art History 270S. One course. *Powell*
- 278S. **Black Political Participation.** (SS) See C-L: Political Science 278S. One course. *Orr*
- 279S. **Race, Racism, and Democracy.** (SS) See C-L: Cultural Anthropology 279S. One course. *Baker*
- 292S. **Slavery and Freedom in Africa, to 1960.** (CZ) See C-L: History 295S; also C-L: Comparative Area Studies. One course. *Ewald*
299. **Special Topics.** Topics vary from semester to semester. One course. *Staff*
- 299S. **Special Topics.** Seminar version of African and African-American Studies 299. One course. *Staff*

## COURSES CURRENTLY UNSCHEDULED

100. **Duke Summer Program: Zimbabwe/Botswana.** (SS)
103. **North African Culture.** (AL)
- 131S. **Comparative Government and Politics: Africa.** (SS)
154. **Art and Philosophy from West Africa to the Black Americas.** (AL)
157. **Art, Architecture, and Masquerade in Africa.** (AL)
164. **History and Religions of North Africa.** (CZ)
- 168S. **The Atlantic Slave Trade.** (CZ)
- 176S. **The Southern Plantation as Historical Laboratory: Research Seminar.** (CZ)
179. **History of South Africa, 1600-1960.** (CZ)
- 195S. **Fugitive Slave (Maroon) Communities in New World Slave Societies.** (CZ)
- 196S. **Issues in the History of Tropical Africa.** (SS)
206. **Origins of Afro-America.** (CZ)
261. **Islam in the African-American Experience.** (CZ)

## THE MAJOR

The major requires ten courses, eight of which must be at the level of 100 or above. Students may choose one of the two following options.

### A. The Americas Focus

*Prerequisite:* African and African-American Studies 51.

*Major Requirements:*

- Three courses focusing upon the Americas in each of the following areas:
  - Arts or Literature
  - History
  - Social, Religious, Economic, or Political Institutions/Processes.
- African and African-American Studies 198S (Senior Seminar).
- Five additional African and African-American Studies courses.



## **B. Africa Focus**

*Prerequisite:* African and African-American Studies 51.

*Major Requirements:*

1. Three courses focusing upon Africa in each of the following areas:
  - a. Arts or Literature
  - b. History
  - c. Social, Religious, Economic, or Political Institutions/Processes.
2. African and African-American Studies 198S (Senior Seminar).
3. Five additional African and African-American Studies courses.

## **THE MINOR**

The minor requires five courses, one of which must be African and African-American Studies 51, and four of which must be at the level of 100 or above. Courses must be selected in each of the following areas:

- a. Arts or Literature
- b. History
- c. Social, Religious, Economic, or Political Institutions/Processes.

*N.B.* Both program foci (Africa and the Americas) must be represented in the four-course selection.

## **Graduation with Distinction**

The program offers work leading to graduation with distinction. See the section on honors in this bulletin and contact the program director.

## **Foreign Languages**

The program recommends that majors complete at least two years of college-level study, or equivalent, of a foreign language. Students interested in additional study of African or Diaspora cultures are strongly encouraged to study an African or Caribbean language.

## **Animal Behavior**

For courses in animal behavior, see Biology.

## **Anthropology**

See the Department of Biological Anthropology and Anatomy and the Department of Cultural Anthropology for information about those majors.

## **Arabic**

For courses in Arabic, see Asian and African Languages and Literature.

## **Art and Art History (ARV/ARH)**

Associate Professor Powell, *Chair*; Associate Professor Stiles, *Director of Undergraduate Studies*; Professors Bruzelius and Wharton; Associate Professors Pratt, and Van Miegroet; Assistant Professors Abe, Cormack, Rice, and Weisenfeld; Professor Emeritus Markman; Assistant Professors of the Practice Noland and Shatzman; Adjunct Assistant Professor Schroth

Majors and minors in art history and visual arts are available in this department.

## HISTORY OF ART (ART)

Art history is the study of works of art in the context of the broader social, political, and intellectual cultures of which they are a part. Studying art history develops the ability to evaluate and organize information, visual as well as verbal; it also enhances the faculties of creative imagination, precise observation, clear expression, and critical judgment. Students of art history acquire a sophisticated understanding of the theory and practice of artistic production and reception.

A major or second major in art history provides basic training for those interested in art-historical or art teaching, museum and gallery work, art publishing, and advertising; the major also furnishes an appropriate background for graduate training in architecture. Art history's emphasis upon careful observation, the ordering of diverse sorts of information, expository writing, and scholarly research makes it a good general preparation for any profession.

**20. Basic Art History.** Credit for Advanced Placement on the basis of the College Board examination in art history. Does not count toward the major in art history or design. One course.

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**52. FOCUS Program Topics in Art History.** (AL) Open only to students in the FOCUS Program. One course. *Staff*

**55. Topics in the History of Spanish Art.** (AL, FL) (Taught in Spanish in Spain.) One course. *Staff*

**69, 70. Introduction to the History of Art.** (AL) The history of western architecture, sculpture, and painting in a cultural context. 69: from prehistory to the Renaissance (c. 1400). 70: from the Renaissance to the present. One course each. *Staff*

**69D, 70D. Introduction to the History of Art.** (AL) Same as Art History 69, 70 except instruction provided in two lectures and one small discussion meeting each week. One course each. *Staff*

**71. Introduction to Asian Art.** (AL) The visual arts of Asia, primarily Chinese and Japanese sculpture, painting, and architecture: selected works in their historical context; the multiple ways in which the works have been understood in the past as well as the present. A range of art historical approaches and methods. C-L: Comparative Area Studies. One course. *Abe*

**71D. Introduction to Asian Art.** (AL) Same as History of Art 71 except instruction provided in two lectures and one small discussion meeting each week. C-L: Comparative Area Studies. One course. *Abe*

**97. Visual Culture Outside the United States, I.** (AL) Course in the visual arts and/or architecture taught in Duke programs abroad. One course. *Staff*

**98. Visual Culture Outside the United States, II.** (AL) See Art History 97. One course. *Staff*

**114. The Aegean Bronze Age.** (CZ) See C-L: Classical Studies 155. One course. *Younger*

**115. Ancient Greece.** (CZ) Prerequisite: Classical Studies 11S, 53, 123, or 124, or History 53, or consent of instructor. See C-L: Classical Studies 147. One course. *Younger*

**117. Pompeii.** (CZ) See C-L: Classical Studies 162. One course. *Richardson*

**120. Egyptian Art and Archaeology.** (AL) Art and architecture of the major urban centers of Egypt, Syria-Palestine, Mesopotamia, and Iran from the fourth millennium B.C. to the conquest of Alexander. Particular emphasis on architecture, sculpture, and painting. C-L: African and African-American Studies 120 and Classical Studies 118. One course. *Staff*

**123. Greek Art and Archaeology I: Geometric to Classical. (AL)** See C-L: Classical Studies 123. One course. *Younger*

**124. Greek Art and Archaeology II: Classical to Greco-Roman. (AL)** See C-L: Classical Studies 124. One course. *Younger*

**126A. Rome: History of the City. (AL, CZ)** See C-L: Classical Studies 145. One course. *Staff*

**126B. Roman Architecture. (AL)** Cities and major monuments of the Roman world. The architecture of Republican Italy (with reference to Hellenistic and Etruscan predecessors) and of the transition to the Empire. Public (state-sponsored) and private monuments (funerary monuments, domestic architecture). C-L: Classical Studies 144. One course. *Cormack*

**128. Art of the Roman Empire. (AL)** Art in the Roman world from Augustus to Theodosius. Emphasis on portraiture, private arts, and triumphal monuments. C-L: Classical Studies 128. One course. *Cormack*

**129. The History of Prints and Printmaking. (AL)** The art of printmaking from the fifteenth through the eighteenth centuries. The impact of the invention of printing; technical and artistic innovations; the contributions of individual artists from Mantegna to Tiepolo. Firsthand experience of basic printmaking techniques in the studio; study of original works of art on frequent trips to local museums and libraries. Consent of instructor required. C-L: Medieval and Renaissance Studies. One course. *Rice*

**130. Late Antique Christian Art. (AL)** Art and architecture of the Christian community from the third to the fifth century in the context of the Roman imperial state. C-L: Classical Studies 130 and Religion 130. One course. *Wharton*

**133. Colonial Art of the Andean Region. (AL, FL)** Colonial art of the Andean region and its modifications through indigenous Aymara and Quéchuá conceptions of space and decoration. Special focus on iconology and the persistence of ancient indigenous myths within Christian images, the colonization of the imaginary through rituals and festivals. The rich variety of Andean textiles and weaving techniques. (Taught in Spanish in the Duke in the Andes Program.) One course. *Staff*

**134. Topics in Medieval Art and Architecture. (AL)** Specific problems dealing with contextual and cultural issues in medieval art and architecture from c. 300 to 1400. C-L: Medieval and Renaissance Studies. One course. *Staff*

**135. Topics in Italian Art and Architecture. (AL)** Topics vary from year to year. Consent of instructor required. (Taught in Italy.) One course. *Staff*

**139. Aspects of Medieval Culture. (CZ)** See C-L: Medieval and Renaissance Studies 114; also C-L: Classical Studies 139, and History 116. One course. *Rasmussen, Solterer, or Witt*

**140. Topics in Renaissance Art. (AL)** Specific problems dealing with the iconography, style, or an individual master from c. 1300 to 1600. Subject varies from year to year. C-L: Medieval and Renaissance Studies. One course. *Rice*

**141. Fifteenth-Century Italian Art. (AL)** Painting, sculpture, and architecture from Masaccio, Donatello, and Brunelleschi to Leonardo. Emphasis on the art of Florence. C-L: Medieval and Renaissance Studies. One course. *Rice*

**142. Sixteenth-Century Italian Art. (AL)** Painting and sculpture in Rome and Florence: Michelangelo, Raphael, Leonardo. The rise and diffusion of mannerism: Pontormo to Tintoretto. C-L: Medieval and Renaissance Studies. One course. *Rice*

**143. The Art of the Counter Reformation. (AL)** Religious art in Catholic Europe during and following the Council of Trent. Rise of the new religious orders; the revival of interest in the early Church and the origins of Christian archaeology; the cult of saints and the veneration of relics; the Church's use of art in its campaign against Protestantism; papal patronage and the monumentalization of Rome. Considers the validity of the concept of a counter-reformation style. C-L: Medieval and Renaissance Studies. One course. *Rice*

**144. Renaissance and Baroque Art History. (AL)** Introduction to the development of painting, sculpture, and architecture in Rome from the fifteenth to the early seventeenth centuries, focusing on the patronage of the Popes and the Papal court. Consent required. Taught at the Intercollegiate Center for Classical Studies in Rome. One course. *Staff*

**145. Renaissance Art in Florence. (AL)** Paintings, sculpture, and architecture from Giotto to Michelangelo based on the works of art preserved in Florence. Emphasis on individual artists and their creations and on the relation of the artists to the society of their times. (Taught in Italy.) C-L: Medieval and Renaissance Studies. One course. *Staff*

**146. Italian Renaissance Architecture. (AL)** Development of building types and city planning in the fifteenth and sixteenth centuries in central and northern Italy. Emphasis on Brunelleschi, Alberti, Bramante, Michelangelo, and Palladio. C-L: Medieval and Renaissance Studies. One course. *Rice*

**148. Art of the Netherlands in the Fifteenth Century. (AL)** Early Netherlandish painting in the Burgundian Netherlands from Hubrecht and Jan Van Eyck to Gerard David and Hieronymus Bosch. Cultural, historical, and intellectual environment in Flanders and Brabant; civic and courtly patronage in Doornik (Tournai), Ghent, Bruges, Mechlin, and Antwerp; new research strategies of contemporary evidence. C-L: Medieval and Renaissance Studies. One course. *Van Miegroet*

**149. Aspects of Renaissance Culture. (AL, CZ)** See C-L: Medieval and Renaissance Studies 115; also C-L: History 148, and Italian 125. One course. *Finucci, Rasmussen, Rice, Van Miegroet, and Witt*

**150. Italian Baroque Architecture. (AL)** Architecture in Italy in the seventeenth and eighteenth centuries. Emphasis on the contributions of Bernini, Borromini, Cortona, Guarini, and Juvarra. The evolution of building types, both secular and religious; town planning; garden and landscape history. Special attention to the cultural, economic, and political forces that shaped the Baroque city. C-L: Medieval and Renaissance Studies. One course. *Rice*

**151. Art of Italy in the Seventeenth Century. (AL)** Caravaggio, the Carracci, Guido Reni, Domenichino, Bernini, and Poussin. Modes of description and narration; the concern with the status of pictorial representation; and the attempts to define and retrieve the canonical achievements of the early sixteenth century. One course. *Rice*

**152. Art of the Netherlands in the Sixteenth Century. (AL)** Painting in Antwerp and the Spanish Netherlands in a period of political turbulence (Reformation, Counter-Reformation); Pieter Bruegel, Frans Floris, Hendrick Goltzius; landscape painters and the exiles at Frankenthal; Flemish painters at the court of Rudolph II in Prague; art and politics in Flanders, Brabant, and Holland. C-L: Comparative Area Studies and Medieval and Renaissance Studies. One course. *Van Miegroet*

**153. Art of the Northern Netherlands in the Seventeenth Century. (AL)** A contextual study of northern Netherlands art, seen through the major Dutch cities and towns where painters, such as Frans Hals and Johannes Vermeer, were at work. Rembrandt and his school; Dutch art in its historical, societal, moral, and psychological context. C-L: Comparative Area Studies and Medieval and Renaissance Studies. One course. *Van Miegroet*



**154. German Art in the Fifteenth and Sixteenth Centuries. (AL)** An examination of German art, including Stefan Lochner, Konrad Witz, Albrecht Dürer, and Hans Holbein the Younger; the significance of the Councils of Konstanz and Basel; the revolutionary impact of the printing press. New trends in sculpture, including the relatively unknown wood carvings created in Nuremberg between 1475 and 1515. C-L: Comparative Area Studies and Medieval and Renaissance Studies. One course. *Van Miegroet*

**155. Mercantile Culture and Art in the Netherlands. (CZ)** The mercantile culture and its relationship with art and the occupation of artist in the Netherlands (fifteenth-seventeenth centuries). The economy of towns, the artist's social position, the place of art in the local economy, and the connections between economic well being and the emergence of art as asset. Commercial evolution: institutions (markets, banks, stock exchanges), instruments (for example, the bill of exchange), and attendant conditions (risk, speculations, panics). The peculiarities of picturing, the role of art as moveable product, liquidity and store of value. Prerequisites: Art History 70 and consent of instructor. C-L: Comparative Area Studies and Economics 152. One course. *De Marchi and Van Miegroet*

**158-159. History of Netherlandish Art and Visual Culture in a European Context. (AL)** See Art History 241-242. (Taught in the Netherlands.) Not open to students who have taken 241-242. C-L: Comparative Area Studies. Two courses. *Van Miegroet*

**161. Nineteenth-Century Art, 1789-1848: Revolution to Revolution. (AL)** Painting and sculpture of leading artists within the movements of neoclassicism, romanticism, and midcentury realism. C-L: Comparative Area Studies. One course. *Staff*

**162. American Art from Colonial Times to 1900. (AL)** The development of an American national school in portraiture, history painting, landscape, genre scenes, and still-life. Major figures include Copley, Bingham, Cole, Church, Whistler, and Eakins. One course. *Powell*

**163. Twentieth-Century American Art: Identity and Nationalism. (AL)** Survey of twentieth-century American art from 1900 to the present, including major stylistic and theoretical developments and movements (that is, the Harlem Renaissance, the "American Scene," and others). Special attention to artistic activities emanating from such government-sponsored programs as the Works Progress Administration's Federal Art Projects, the Farm Security Administration's Photography Units, and the National Endowment for the Arts' various programs. One course. *Powell*

**164. Early Chinese Art. (AL)** Chinese art from the earliest times to the third century C.E. Emphasis on the cultural and historical contexts of ceramics, cast-bronze vessels, sculpture, and painting. Special attention to new archaeological discoveries in China. C-L: Comparative Area Studies. One course. *Abe*

**165. Introduction to Israeli Culture. (AL, CZ)** See C-L: Asian and African Languages and Literature 155. One course. *Zakim*

**166. Nineteenth-Century Art after 1848: Early Modernism. (AL)** A survey of the second half of the nineteenth century in Europe with particular emphasis on realism, impressionism, postimpressionism, and symbolism. One course. *Stiles*

**167. Twentieth-Century Art, 1900-1945: The Avant-garde and Modernism. (AL)** Major artistic movements and theoretical aims of early modernism: fauvism, cubism, expressionism, futurism, constructivism, suprematism, dada, surrealism, deStijl, Bauhaus, and Neue Sachlichkeit. C-L: Comparative Area Studies and Women's Studies. One course. *Stiles*

**168. Art since 1945: Modernism and Postmodernism.** (AL) Major artistic movements and theory in Europe and the United States after World War II: abstract expressionism, color field, pop art, minimal art, Arte Povera, process, conceptual, and performance art, earthworks, photo-realism, neo-expressionism, and appropriation. C-L: Comparative Area Studies, Perspectives on Marxism and Society, and Women's Studies. One course. *Stiles*

**169. Documentary Photography and Social Activism in the Nuclear Age.** (AL) The role of photojournalism and documentary photographers in recording and communicating vital issues of the nuclear age including nuclear weapons testing and its effects, the environmental issues surrounding fallout and nuclear power-plant accidents, low-level waste disposal, and other human and environmental issues related to war, the technology of nuclear weapon and energy production and their cultural manifestations. C-L: Comparative Area Studies and Film and Video. One course. *Stiles*

**170. Chinese Buddhist Art.** (AL) Chinese sculpture, painting, and architecture in relation to Buddhist texts, practice, and ritual from the fourth through the ninth century C.E. Introduction to precedents in Indian and Central Asian Buddhist art. Emphasis on the relationship between Buddhist and non-Buddhist imagery. C-L: Comparative Area Studies. One course. *Abe*

**171. Chinese Painting.** (AL) The art of painting in China from the earliest times to the nineteenth century C.E. Emphasis on landscape painting and collecting, issues of aesthetics, and the construction of an art history in China. C-L: Comparative Area Studies. One course. *Abe*

**172. Topics in Asian Art.** (AL) Examples of the visual arts of China and Japan organized around a single theme or genre such as painting, Buddhist art, or cinema. C-L: Comparative Area Studies. One course. *Abe*

**176. The Blues Aesthetic: African-American Art in the Twentieth Century.** (AL) Art of the twentieth century, with an emphasis on works derived from an Afro-United States cultural perspective. Major figures include Aaron Douglas, Jacob Lawrence, Charles White, Elizabeth Catlett, and Romare Bearden. C-L: African and African-American Studies 156. One course. *Powell*

**179. The History of Performance Art.** (AL) Works in the visual arts in which the primary means and medium of expression is the human body in happenings, Fluxus, demonstrations, destruction art, body art, and performance since 1955. Theoretical discussion focusing on the challenge that live art poses to the traditional paradigm of the art object. C-L: Comparative Area Studies, Drama 179, and Women's Studies. One course. *Stiles*

**180A. History of Japanese Art I: Prehistoric to Early Modern.** (AL) Survey of Japanese visual culture from prehistoric times to the end of the sixteenth century. Painting, sculpture, calligraphy, architecture, ceramics, decorative arts, and print media. The relationship between artistic production and Japanese sociopolitical development; issues of Sino-Japanese cultural exchange, religion, region, gender, and class. One course. *Weisenfeld*

**180B. History of Japanese Art II: Early Modern to the Present.** (AL) Survey of Japanese visual culture from the end of the sixteenth century to the contemporary period encompassing the country's unification under Tokugawa rule and later emergence on the world stage as a nation of international stature. Painting, sculpture, architecture, ceramics, decorative arts, and print media. The relationship between artistic production and Japanese society; issues of religion, region, race, gender, class, and nationalism. One course. *Weisenfeld*

**181A. Japanese Print Culture.** (AL) Issues in Japanese print culture from the seventeenth to the twentieth century. An introduction to the rich and diverse Japanese printmaking tradition; a forum for the critical evaluation of related theoretical issues. The relationship

between prints and economics, politics, technology, literature, religion, and philosophy; concerns related to gender, representation, aesthetics practice, and patronage. One course. *Weisenfeld*

**183. Etruscan Art and Architecture. (AL)** The art of the Etruscans, inhabitants of central Italy from the ninth through the second centuries B.C. Painting, sculpture, pottery, tomb architecture, domestic architecture, and portraiture. Theories of Etruscan origins; particular emphasis on Etruria's contacts with other cultures (Greek, Roman, Anatolian) and the effects of these contacts on Etruscan artistic productions. C-L: Classical Studies 183. One course. *Cormack*

**184. History of Impressionism. (AL)** The evolution of the impressionist movement and postimpressionist reactions of the 1880s. Particular attention to the work of Manet, Degas, Monet, Renoir, and Pissarro. C-L: Comparative Area Studies. One course. *Staff*

**187. Surrealism. (AL)** The origins, aims, literature, and politics of the international movement of surrealism, which flourished between the world wars, examined in the context of surrealist theory. The psychoanalytic and metaphysical sources of surrealist poetry and visual representations as reflecting a utopian ideology of liberation. C-L: Comparative Area Studies and Women's Studies. One course. *Stiles*

**188. Twentieth-Century Modernist and Postmodernist Criticism. (AL)** A survey of the writings of artists, critics, and art historians from the late nineteenth century to the present, concentrating on major critical debates and on the interplay of various methodologies including formalist, iconographic, Marxist, feminist, psychoanalytic, structuralist, and poststructuralist in the interpretation of twentieth-century art. One course. *Stiles*

**189. Modern and Postmodern Architecture. (AL)** The history of architecture from nineteenth-century Beaux-Arts classicism through art nouveau and the modern movement to postmodernism. Political and ideological as well as the formal and technical aspects of building investigated through primary texts. C-L: Perspectives on Marxism and Society. One course. *Wharton*

**190. Berlin: Architecture and the City, 1871-1990. (AL, CZ)** Development of urban Berlin from the Grunderzeit (the Boom Years) of the 1870s to the present: architecture of Imperial Berlin; the Weimar and Nazi periods; post World War II; reconstruction as a reunified city. The major architectural movements from late historicism to postmodernism. (Taught only in the Duke-in-Berlin Program.) One course. *Neckenig*

**191, 192. Independent Study.** Directed reading and research. Open only to qualified students in the junior year, by consent of director of undergraduate studies. One course each. *Staff*

**195. Pre-Columbian Art and Culture of Andean South America. (AL)** The art of Peru, Bolivia, Ecuador, and Colombia from the beginnings of permanent settlements through the coming of the Spaniards (1534 A.D.), concentrating on sociopolitical and religious institutions. C-L: Comparative Area Studies and Latin American Studies. One course. *Staff*

### **For Seniors and Graduates**

**201S. Topics in Greek Art. (AL)** Specific aspects of the art or architecture in the Greek world from the late Geometric to the Hellenistic periods. Subject varies from year to year. Consent of instructor required. C-L: Classical Studies 220S. One course. *Cormack*

**202S. Topics in Roman Art. (AL)** Selected topics in the art and architecture of late republican and imperial Rome. Subject varies from year to year. Consent of instructor required. C-L: Classical Studies 227S. One course. *Cormack*



**205S. Greek Architecture. (AL)** See C-L: Classical Studies 233S. One course. *Richardson or Younger*

**217. Islam and Islamic Art in India. (AL, CZ)** See C-L: Religion 217; also C-L: Comparative Area Studies. One course. *Lawrence*

**227S. Roman Painting. (AL)** See C-L: Classical Studies 236S. One course. *Richardson*

**236S. Topics in Romanesque and Gothic Art and Architecture. (AL)** Analysis of an individual topic. Subject varies from year to year. Consent of instructor required. C-L: Medieval and Renaissance Studies. One course. *Bruzelius*

**237S. Greek Painting. (AL)** See C-L: Classical Studies 232S. One course. *Stanley*

**238S. Greek Sculpture. (AL)** See C-L: Classical Studies 231S. One course. *Younger*

**241-242. History of Netherlandish Art and Visual Culture in a European Context. (AL)** A contextual study of visual culture in the Greater Netherlands and its underlying historical and socioeconomic assumptions from the late medieval to early modern period, through immediate contact with urban cultures, such as Amsterdam, Leiden, Utrecht, Brussels, Ghent, Bruges, and Antwerp. Includes daily visits to major museums, buildings, and sites; hands-on research in various collections; discussion sessions with leading scholars in the field; and a critical introduction to various research strategies. (Taught in the Netherlands.) Not open to students who have taken Art History 158-159. C-L: Comparative Area Studies. Two courses. *Van Miegroet*

**243S. Topics in Netherlandish and German Art. (AL)** Specific problems in northern Renaissance or baroque art such as the Antwerp workshops of the sixteenth century or a critical introduction to major artists such as Van Eyck, Bosch, Dürer, and Rubens. An analytical approach to their lives, methods, atelier procedures and followers; drawings and connoisseurship problems; cultural, literary, social, and economic context; documentary and scientific research strategies. Subject varies from year to year. Consent of instructor required. C-L: Comparative Area Studies and Medieval and Renaissance Studies. One course. *Van Miegroet*

**247S. Topics in Italian Renaissance Art. (AL)** Specific problems dealing with iconography, style, or an individual master from c. 1300 to 1600. Subject varies from year to year. Consent of instructor required. C-L: Medieval and Renaissance Studies. One course. *Rice*

**257S. Topics in Pre-Columbian Art and Culture. (AL)** Selected topics in pre-Columbian art and archaeology with an emphasis on the political and cultural context of the artifact. Subject varies from year to year. Consent of instructor required. C-L: Comparative Area Studies. One course. *Staff*

**260S. Topics in Italian Baroque Art. (AL)** Problems in Italian art and architecture from c. 1580 to c. 1750. Topics vary from year to year. Consent of instructor required. C-L: Medieval and Renaissance Studies. One course. *Rice*

**265S. Topics in Nineteenth-Century Art. (AL)** Focus on a major artist, movement, or trend in nineteenth-century art. Subject varies from year to year. Consent of instructor required. One course. *Stiles*

**270S. Topics in African Art. (AL)** Specific problems of iconography, style, or a particular art tradition. Subject varies from year to year. Consent of instructor required. C-L: African and African-American Studies 270S. One course. *Powell*

**271S. Topics in Art of the United States. (AL)** Selected topics from colonial times to 1945, with emphasis on major cultural issues, movements, works, and/or artists. Consent of instructor required. One course. *Powell or Stiles*



272S. **Topics in Chinese Art.** (AL) Problems and issues in a specific period or genre of Chinese art. Specific focus varies from year to year. C-L: Comparative Area Studies. One course. *Abe*

274S. **Topics in Japanese Art.** (AL) Problems and issues in a specific period or genre of Japanese art. Specific focus varies from year to year. Consent of instructor required. C-L: Comparative Area Studies. One course. *Weisenfeld*

283S. **Topics in Modern Art.** (AL) Selected themes in modern art before 1945, with emphasis on major movements or masters. Subject varies from year to year. Consent of instructor required. C-L: Comparative Area Studies. One course. *Stiles*

288. **Special Topics.** (AL) Subjects, areas, or themes that embrace a range of disciplines or art historical areas. One course. *Staff*

291, 292. **Independent Study/Special Problems in Art History.** Directed reading and research. Consent of instructor required. One course each. *Staff*

296S. **Methodology of Art History.** (AL) Approaches to the study and theory of art: historiography, connoisseurship, iconology, and criticism. Consent of instructor required. One course. *Staff*

297S. **Topics in Art since 1945.** (AL) Historical and critical principles applied to present-day artists and/or movements in all media since World War II. Consent of instructor required. C-L: Comparative Area Studies. One course. *Stiles*

298S. **Topics in Modern and Postmodern Architecture.** (AL) The study of particular architects, movements, or building genres in their conceptual and political contexts. Subject varies from year to year. Consent of instructor required. C-L: Comparative Area Studies. One course. *Wharton*

299S. **Critical Theory.** (AL) Understanding of the visual arts in terms of the theoretical developments in other disciplines (for example, literature, women's studies, Marxism, and anthropology). Focus on the writings of theory-centered art historians and critics. Consent of instructor required. One course. *Stiles or Wharton*

### Courses Currently Unscheduled

100. **Art and Architecture of Vienna.** (AL)

116S. **Athens.** (CZ)

131. **Art of the Early Middle Ages.** (AL)

132. **Art of the Late Middle Ages.** (AL)

137. **Roman and Non-Roman in Ancient Italy.** (CZ)

147. **Byzantine and Ottoman Art and Architecture in the City of Constantinople/Istanbul.** (CZ)

156. **Art of the Southern Netherlands in the Seventeenth Century.** (AL)

173. **Art, Architecture, and Masquerade in Africa.** (AL)

174. **Art and Philosophy from West Africa to the Black Americas.** (AL)

175. **Art and Material Culture of the Southern United States.** (AL)

177. **The History of Conceptual Art.** (AL)

178. **Pre-Columbian Art and Architecture.** (AL)

186. **Feminism in Twentieth-Century Art.** (AL)

193. **Art and Culture of Mesoamerica.** (AL)

194. **Maya Art and Culture.** (AL)

206S. **Roman Architecture.** (AL)

233S. **Topics in Early Christian and Byzantine Art.** (AL)

244A, S. **International Expressionism.** (AL)

244B, S. **International Modernism.** (AL)

## VISUAL ARTS (ARV)

Studio art courses offer directed experiences in the practice of the visual arts, enhancing the understanding of art both within the history of culture and as an individual human achievement. Department offerings emphasize the analysis and articulation of visual concepts and processes as they relate to a broader education in the humanities and sciences.

A major or concentration in studio art can provide the foundation for further study in various areas of the visual arts. It may prepare the student for further training as an artist, teacher, or architect, as well as in related fields such as advertising or design. Lower-level courses emphasize the fundamentals of drawing, color, and form; upper-level courses encourage the student to develop a more individual conceptual approach and style, within the context of historical precedents and traditions.

**21. General Art, Studio.** Credit for advanced placement on the basis of the College Board examination in Studio Art. Does not count toward the major in visual arts. One course.

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**53. Drawing. (AL)** Introduction to the visual language of drawing, including various media and processes. Learning to construct and develop drawings done from observation, through reference to other artist's work, and with frequent individual and group critiques. Consent of instructor required. One course. *Staff*

**54. Two-Dimensional Design and Color. (AL)** Experiments in form and color, with work from observation. Introduction to color theory in various media. Consent of instructor required. Prerequisite: Visual Arts 53. One course. *Pratt*

**101. Book Illustration. (AL)** Studio course examining all aspects of bookmaking, including theories of bookmaking, designing and planning, typography, computer design, illustration, and binding. Prerequisites: Visual Arts 53 and consent of instructor. One course. *Shatzman*

**102. Figure Drawing. (AL)** The human figure through different artistic media and from different visual perspectives. Prerequisites: Visual Arts 53 and 54, and consent of instructor based on portfolio. One course. *Staff*

**103. Graphic Design: Community Projects. (AL)** Application of principles of graphic design, color, typography, and layout to create products serving a promotional purpose. Students work with nonprofit organizations from the community as "clients," covering all phases of the design process. Prerequisites: Visual Arts 53 and 54, and consent of instructor. One course. *Shatzman*

**105. Intermediate Drawing. (AL)** Allows students to explore their artistic interests and biases through a series of self-directed projects. Both the directness and the flexibility of the medium of drawing are investigated. Prerequisites: Visual Arts 53 and 54 and consent of instructor. One course. *Pratt*

**110. Sculpture. (AL)** Sculptural principles, processes, and issues introduced through lectures, readings, studio assignments, individual projects, and field trips. Consent of instructor required. One course. *Noland*

**111. Intermediate Sculpture. (AL)** Studio practice in sculpture at the intermediate level. Group and individual discussion and critique. Prerequisite: Visual Arts 110 or consent of instructor. One course. *Noland*

**116. Photography. (AL)** An emphasis on how to see with the camera and ways of thinking about photographs. Class assignments accompanied by historical and theoretical readings, lectures, class discussions, and field trips. Final projects are a self-portrait series and an individual documentary essay. Prerequisites: camera and consent of instructor. C-L: Film and Video. One course. *Noland*

**118S. American Communities: A Photographic Approach.** (SS) Consent of instructor required. See C-L: Public Policy Studies 176S; also C-L: Film and Video. One course. *Harris or Sartor*

**119S. Advanced Documentary Photography.** (SS) Prerequisite: Visual Arts 118S, Public Policy Studies 176S, or consent of instructor. See C-L: Public Policy Studies 177S; also C-L: Film and Video. One course. *Harris*

**120. Painting.** (AL) Studio practice in painting with individual and group criticism and discussion of important historic or contemporary ideas. Prerequisites: Visual Arts 54 or equivalent and consent of instructor. One course. *Pratt*

**121. Intermediate Painting.** (AL) Further practice in painting, with emphasis on color and refinement of form. Prerequisites: Visual Arts 120 and consent of instructor. One course. *Pratt*

**130. Printmaking: Silkscreen.** (AL) Investigation of the silkscreen medium and its stencil-making processes including paper stencils, blockouts crayon, and photographic methods. Prerequisites: Visual Arts 53, 54 and consent of instructor. One course. *Shatzman*

**131. Printmaking: Lithography.** (AL) Introduction to stone lithography and its drawing and printing methods. Includes both black and white and color printing. Prerequisites: Visual Arts 53, 54 and consent of instructor. One course. *Shatzman*

**132. Printmaking: Relief and Monotype.** (AL) Relief methods of woodcut and linoleum block printing and monotype techniques. Concentration on both the technical and historical aspects of the media and its expressive potentials. Prerequisites: Visual Arts 53, 54 and consent of instructor. One course. *Shatzman*

**133. Printmaking: Intaglio.** (AL) Directed problems in the intaglio medium including etching, aquatint, drypoint, black and white and color printing methods. Prerequisites: Visual Arts 53, 54 and consent of instructor. One course. *Shatzman*

**140. Ceramics.** (AL) Studio practice in the fundamentals of ceramics, including handbuilding, wheel, and throwing techniques. Also clay sculpture with emphasis on figurative and architectural forms. Group and individual criticism. Experimentation with range of surfaces and glazes. Study of both historical and contemporary ceramics. Consent of instructor required. One course. *Staff*

**141. Architectural Ceramics.** (AL) Introduction to historical and contemporary ceramic tile, posing the questions of meaning and use as architectural symbol and ornament. Selected cultural approaches; studio techniques of ceramic production; color/pattern/form considerations of tile murals. Students and instructor create a mural. Consent of instructor required. One course. *Staff*

**143. Architecture.** (AL) A study of the principles of architectural design. Application of these principles to the special architectural, civil, and environmental requirements of North Carolina. Architectural design problems formulated and analyzed through individual and group projects; case studies; field trips to area buildings and architectural firms; visits by architects and engineers. Open only to students in the FOCUS Program. One course. *Brasier and Freelon*

**145. Public Art and Private Concerns.** (AL) Investigation of historical and contemporary examples of public art, its definition, purposes, and precedents. Public art seen against artistic intention and public reaction. Field trips to area installations; visits by artists and administrators in the field. One course. *Pratt*

**165S. Film Animation Production.** (AL) See C-L: Film and Video 102S. One course. *Burns*

**178. Doing Documentary Work. (AL, SS)** See C-L: Public Policy Studies 178; also C-L: English 171, and History 150C. One course. *Coles and Harris*

### For Seniors and Graduates

**200S. Theory of Design. (AL)** Visual thinking and design innovations in historical and contemporary art. Formal analysis and discussion of important issues for students involved in creating art. Prerequisites: two courses in design and consent of instructor. One course. *Pratt*

**205. Advanced Drawing. (AL)** Emphasis on the development of a body of work through the adventurous exploration of the possibilities of drawing. Intensive studio work is accompanied by research into topics of interest and class presentations. Prerequisites: Visual Arts 105 and consent of instructor. One course. *Pratt*

**210. Advanced Sculpture. (AL)** Studio practice in sculpture at the advanced level. Group and individual discussion and critique. Prerequisites: Visual Arts 110, and 111, or consent of instructor. One course. *Noland*

**217, 218. Individual Project. (AL)** Independent work open to highly qualified juniors and seniors on recommendation of instructor and invitation of department. One course each. *Staff*

**220. Advanced Painting. (AL)** Prerequisites: Visual Arts 120, 121 and consent of instructor. One course. *Pratt*

**230. Advanced Printmaking. (AL)** Emphasis on the visual and conceptual development through experimentation and practice in printmaking in the student's medium of choice. Prerequisites: Visual Arts 53, 54, 130, 131, 133, and consent of instructor. One course. *Shatzman*

See also Institute of the Arts in this bulletin.

## THE MAJOR

The student will elect a sequence of courses emphasizing either the history of art or visual art.

### History of Art

*Major Requirements.* The major in art history requires ten courses, at least eight at or above the 100 level. Required are two of the three introduction to art history courses: Art History 69, 70 and 71. The other eight courses should be distributed across the fields of ancient, medieval, Renaissance/baroque, modern, and non-western (pre-Columbian, African, Oriental). Art History 71 will not fulfill the non-western requirement. Students must, in any case, take at least one course in each of these five areas. No fewer than one of these ten courses must also be a 200-level seminar. Two years of college-level study or the equivalent in French, German, or Italian are strongly recommended. Majors contemplating graduate work in the history of art are advised to take more than ten courses in the history of art and to gain competence in French and German. It is suggested that students who are interested in preparing for graduate work in architecture supplement their major requirements in the history of art and architecture with the following courses: Mathematics 31, 32 and either Mathematics 103 or Physics 51L, 52L; Visual Arts 53 and either Visual Arts 54 or 56; Institute of the Arts/Biology 45S; Engineering 75L or 83L.

### Visual Arts

*Major Requirements.* The major in visual arts requires at least ten courses. These include: two lower level courses (Visual Arts 53 and 54); and eight 100-level courses including two upper-level art history courses. The remaining six courses must include a minimum of one



course in each of the primary areas of instruction: painting, printmaking, and sculpture. Students are encouraged to enroll in an independent study as seniors.

## **COMBINED MAJOR IN ART HISTORY/VISUAL ARTS**

A combined major in art history and visual arts requires at least fourteen courses. These include: two lower-level courses (Visual Arts 53 as well as Art History 69, 70 or 71); and twelve upper-level courses (i.e., at or above the 100 level). The twelve upper-level courses are to be divided as follows:

*Art History:* Six upper-level courses distributed across the fields of ancient, Renaissance/baroque, modern, and non-western (pre-Columbian, African, Asian). Students must take at least one course in four of these five areas. At least one of these courses must also be a 200-level seminar.

*Visual Arts:* Six 100-level courses including a minimum of one course in each of the primary areas of instruction: painting, printmaking, and sculpture. Seniors are encouraged to enroll in an independent study and, during the spring of that year, in Visual Arts 200S.

## **Graduation with Distinction**

The department offers work leading to graduation with distinction. See the section on honors in this bulletin.

## **THE MINOR**

### **Art History**

*Requirements:* Five courses in art history at the 100 level or above.

### **Visual Arts**

*Requirements:* Five courses in visual arts at the 100 level or above.

## **Institute of the Arts (AI)**

A certificate, but not a major, is available in this program.

The Institute of the Arts administers an undergraduate certificate program in the Integrated Arts, offers interdisciplinary courses, sponsors artist residencies, coordinates and promotes activities in the creative and performing arts, and works to extend the role of the artists at Duke into the surrounding community. Courses, festivals, and events sponsored by the institute bring together faculty and students in different art forms to encourage an interdisciplinary perspective. A semester-long off-campus program, Duke in New York Arts Program, offered each fall semester provides academic and professional experiences for selected juniors and seniors. For further information about the institute, inquire in 109 Bivins Building.

## **INTEGRATED ARTS CERTIFICATE**

The Integrated Arts Certificate is designed to give students a meaningful relationship to art through a dual focus on theory and practice, emphasizing experience in the process of making creative decisions and an understanding of the traditions against which individual expression is played out. An interdisciplinary approach permits exploration of the elements that are present in all art creation and reception: the artist, artists' media, artwork, and audience. The certificate requires six courses, beginning with a foundation course (Institute of the Arts 100), team-taught by artist-faculty from three different disciplines, that combines master classes in lecture format with a studio component (lab) consisting of actual performance work in the different disciplines. Following the foundation course, students may elect three practical arts courses from a list of approved courses in Dance, Drama,

English, Film and Video, Music, and Visual Art. Two capstone courses are required: a seminar in the history of aesthetics (Literature 182), and an interdisciplinary creative/performance seminar (Institute of the Arts 130S).

## DUKE IN NEW YORK ARTS PROGRAM

The institute-sponsored Duke in New York Arts Program offers an intensive, off-campus experience for juniors and seniors wishing to spend a semester studying and working in an internship situation in the fields of visual and performing arts, museum and gallery management, theater, film, literary arts, and other related fields. The program has four components, each earning one credit: two seminars, Institute of the Arts 101S and 103S; an arts internship, Institute of the Arts 102; and an elective course at New York University.

## INSTITUTE OF THE ARTS (AI)

**100. Art and Its Making. (AL)** The foundational course of the Integrated Arts Program acquainting students with the common concerns in the arts (creative writing, dance, drama, film/video, music, visual arts) utilizing the analytic paradigm of artist/media/artwork/audience to understand the creative process. Three units, each devoted to one of the arts—creative writing, dance, drama, music, or visual arts—culminating in a final synthesis in which issues common to all the arts, and those separating them, can be meaningfully explored. Faculty includes Dickinson, Dunn, Lentricchia, McAuliffe, Moreno, Noland, Pérez-Firmat, Stiles, and Taliaferro. One course. *Staff*

**101S. Arts Resources in New York. (AL)** Investigation of a central theme through attendance at selected art events in the New York area supplemented by discussions, critical papers, and reports. Visiting Duke faculty members and New York practitioners in the arts provide guest lectures and lead discussions. Open only to those admitted to the Duke in New York Arts Program. One course. *Staff*

**102. Arts Internship in New York.** Immersion in the professional art world through apprenticeship to a sponsoring artist or organization. Students will spend fifteen hours per week at the internship and will write a substantive paper containing significant analysis and interpretation of the relation of the students' sponsoring institution to the art form or activity as a whole, the system of production and consumption surrounding that art form or activity, and the sponsor's organizational framework, operating mechanics, and role in the creation, preservation, or interpretation of that art form or activity. Offered only on the pass/fail basis and open only to students admitted to the Duke in New York Arts Program. One course. *Staff*

**103S. Arts Production, Promotion, and Presentation in New York.** Analysis and investigation of the processes by which representative arts events and endeavors in New York are conceived, developed, produced, promoted, performed, and evaluated. Guest lectures by practitioners in these processes. Open only to students admitted to the Duke in New York Arts Program. One course. *Staff*

**130S. Interdisciplinary Arts: Performance Seminar. (AL)** Culmination of the experiences and study of the previous courses in the Integrated Arts Program. An interactive seminar taught by one faculty artist and one faculty advisor (from two different disciplines). Creation of a final presentation integrating creative writing, dance, drama, film/video, music, and visual art and examination of its design, direction, and production outside conventional institutional boundaries. The students work as an ensemble to create a mixed-media presentation, stimulated by an initial theme or artwork, and incorporating the talents and interests of participating students and faculty (including Dickinson, Dunn, McAuliffe, Noland, Pratt, Stiles, Storer, Raimi, Taliaferro, and E. Wilson). Prerequisites: Institute of the Arts 100 and two practical arts courses from two different disciplines. One course. *Staff*

**150. Managing the Arts.** Various aspects of planning, organization, promotion, resource development, and general operations of such typical arts organizations as arts councils, museums and galleries, subscription series, orchestras, and dance and theatre companies. Private, public, and governmental support for the arts. Not open to freshmen. One course. *Silbiger*

**180, 181. Special Topics. (AL)** Subjects associated with visiting artists-in-residence in the institute. Discussions and lectures conducted by guest artists on aspects of their work, views of the arts, associations with other disciplines. Previous topics have included "George Balanchine and Contemporary Ballet" and "Aspects of Broadway Bound." Topics announced each semester. Half course, one course, respectively. Variable credit. *Staff*

**191, 192. Independent Study.** Directed reading and research. Consent of instructor required. One course each. *Staff*

## **COURSES CURRENTLY UNSCHEDULED**

**122. The Arts in Contemporary Culture. (AL)**

## **Asian and African Languages and Literature (AAL)**

Professor Cooke, *Director*; Associate Professor of the Practice Khanna, *Director of Undergraduate Studies*; Associate Professor Wang; Assistant Professors Ching, Yoda, and Zakim; Assistant Professors of the Practice Cornell, Endo, and Lee; Lecturers Son-Yarbrough and Yao; Instructors Shah and Yanagida. *Affiliated faculty*: Professors Lawrence (religion) and Jonassaint (romance studies)

A major or a minor is available in this program.

Asian and African Languages and Literature provides instruction in several languages and literatures of Asia and Africa. Languages offered are Arabic, Chinese, Hebrew, Hindi, Japanese, Korean, Persian, and Swahili. The program offers Arabic, Chinese, Hebrew, Hindi, Japanese, and Korean literature courses, many in translation.

## **ASIAN AND AFRICAN LANGUAGES AND LITERATURE (AAL)**

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**121. Introduction to Asian and African Literature. (AL)** An exploration of the ways in which different societies in Asia and Africa encourage particular constructions of self, sexuality, and purposeful life in literature and film. C-L: African and African-American Studies 121 and Comparative Area Studies. One course. *Staff*

**137. Contemporary Culture in South Asia. (AL, CZ)** Everyday life in Indian cities and villages as represented in popular and intellectual media. Perspectives on cinema, television, and radio along with more traditional media. The fiction of Mohan Rakesh, the poetry of Muktibodh, the cinema of Aravindan and Satyajit Ray, the great Indian epics on Indian television. Taught in English. C-L: Comparative Area Studies. One course. *Khanna*

**150S. Chinese Modernism in Post-Mao Era. (AL)** Mainland Chinese aesthetic modernity in the 1980s and 1990s examined through the study of narrative fiction and films. One course. *Wang*

**153. East Asian Cultural Studies. (AL, CZ)** East Asia as a historical and geographical category of knowledge emerging within the various processes of global movements (imperialism, colonialism, economic regionalism). C-L: Comparative Area Studies and Cultural Anthropology 146. One course. *Staff*

**155. Introduction to Israeli Culture. (AL, CZ)** The examination of contemporary Israeli culture through art, film, architecture, and literature. Concentration on interdisciplinary critical approaches to culture; interconnections of culture and Zionist ideology in the Israeli projection of the nation. C-L: Art History 165. One course. *Zakim*

**160, 161. Introduction to the Civilizations of Southern Asia. (CZ)** The literary, historic, linguistic, and ethnic diversity of South Asia presented through both readings and contemporary films. Not open to students who have taken Religion 160, 161. C-L: Comparative Area Studies, Cultural Anthropology 101, 102, History 193, 194, and Religion 144, 145. One course each. *Khanna*

**162. Modern Japanese Literature and Culture. (AL, CZ)** An examination of modern Japanese culture through a variety of media including literary texts, cultural representations, and films. Different material each year; may be repeated for credit. C-L: Comparative Area Studies. One course. *Ching or Yoda*

**163. Korean Literature in Translation. (AL)** A chronological overview from earliest times until today. Begins with a brief introduction to Korean language and history as they relate to the study of literature. Novels, essays, classics, and various other genres. C-L: Comparative Area Studies. One course. *Staff*

**165S. Modern Arabic Literature in Translation. (AL)** Novels and short fiction from Egypt, Lebanon, Sudan, Palestine, North Africa, and the Arabian peninsula. Issues of identity formation in postcolonial societies, gender construction, and representation of conflict. C-L: Comparative Area Studies. One course. *Staff*

**167. Asian Art and Theater. (AL)** See C-L: Drama 167. One course. *Ma*

**168. Francophone Literature. (AL, FL)** Prerequisite: good knowledge of French. See C-L: French 168; also C-L: African and African-American Studies 138, Canadian Studies, Comparative Area Studies, and Latin American Studies. One course. *Jonassaint or staff*

**174. North African Literature in Translation. (AL)** Postcolonial literature of North Africa, namely Morocco, Algeria, and Tunisia. Particular attention paid to the ways various writers have voiced issues of identity resulting from the conflictual co-existence of national and colonial culture. C-L: African and African-American Studies 177 and Comparative Area Studies. One course. *Chergui*

**180S. Intellectuals/Culture/History: Modern China in Transition. (AL, CZ)** Debates over politics, ideology, high culture, and popular culture in China since the 1920s. Topics include: Marxism, the cultural Revolution; the modernist narratives of "world history"; the postmodern turn of debunking universal history; the 1990s' resurgence of Mao Zedong fever, the Chinese search for modernity, the revival of neo-nationalism and new conservatism; and state sponsorship and the new meanings of "culture as leisure." One course. *Staff*

**182S. The Forbidden Books: Issues of Censorship in China. (AL)** Topics include the tradition of book burning in premodern China, state ideology, religious prosecution and censorship, the problem of pornography, sexuality, and the emergence of the counter-Neo-Confucianist category of *qing* ("feelings/emotions") in the sixteenth century, the Literary Inquisition of the Qing dynasty, institutionalized censorship in Mao's era, and cultural policies in post-Mao China. C-L: Comparative Area Studies. One course. *Wang*

**183S. Modern Hebrew Literature in English Translation. (AL)** Topics in the critical study of Hebrew literature and Israeli culture. Emphasis on developing analytical skills within a broad range of critical theories. Close readings of cultural production tied to theoretical inquiries of nationalism, marginality, ideology, each year concentrating on a particular set of theoretical issues. C-L: Judaic Studies. One course. *Zakim*



**188. The Politics of Women's Liberation in the Arab World. (CZ)** A multidisciplinary study combining the sexual with the political, religion with history, economics with culture, women's health with ethics. Specific characteristics, tendencies; relations with the state and political parties; interests it shares with women in the South and North. The changes in the situation of Arab women resulting from the new world order. C-L: Women's Studies. One course. *Staff*

**190. Women in Islam: Fact and Fiction. (CZ)** The forces influencing the lives of Muslim women from the seventh to the twentieth century. Geographical or historical focus may change. Themes to include: imperialism and resistance, family, religion, literature. C-L: African and African-American Studies 160, Comparative Area Studies, Religion 139, and Women's Studies. One course. *Cooke*

**191. Independent Study.** Consent of instructor and director of undergraduate studies required. One course. *Staff*

**196S. Special Topics in Advanced Film, Video, or Audio Production. (AL)** Topics will vary each semester. One course. *Staff*

**197S. Studies in Asian and African Literature.** Topics vary each semester. One course. *Staff*

**198. Special Topics in Music and Culture. (AL, CZ)** Focus will be on historical developments, important instruments and genres, and cultural contents for musical performance, preservation, and adaptation. One course. *Kramer*

**200S. Seminar in Asian and African Cultural Studies. (CZ)** Concentration on a theoretical problem or set of issues germane to the study of Asian and African cultures. C-L: African and African-American Studies 200S, Cultural Anthropology 288S, and Literature 200S. One course. *Staff*

**250S. Chinese Modernism in Post-Mao Era. (AL)** Mainland Chinese aesthetic modernity in the 1980s and 1990s examined through the study of narrative fiction and films. (Same as Asian and African Languages and Literature 150S but requires extra assignments.) One course. *Wang*

**252. Special Topics in Asian and African Literature. (AL)** Topics vary each semester. One course. *Staff*

**253. East Asian Cultural Studies. (AL, CZ)** East Asia as a historical and geographical category of knowledge emerging within the various processes of global movements (imperialism, colonialism, economic regionalism). (Same as Asian and African Languages and Literature 153 but requires extra assignments.) C-L: Comparative Area Studies and Cultural Anthropology 254. One course. *Staff*

**259. The Bestseller: Cultural Populism in the 1990s' China. (AL)** The bestseller culture industry in post-Mao China. Topics include the classification of the high, low, and middle brow cultures of the bestseller, the publishing industry's response to the issues of subcultures, consumerism, and the post-Mao social imaginary, the consumption of politics, and tabooed subjects. C-L: Cultural Anthropology 263 and Literature 279. One course. *Wang*

**262. Modern Japanese Literature and Culture. (AL, CZ)** An examination of modern Japanese culture through a variety of media including literary texts, cultural representations, and films. Different material each year; may be repeated for credit. (Same as Asian and African Languages and Literature 162 but requires extra assignments.) C-L: Comparative Area Studies and Cultural Anthropology 260. One course. *Ching or Yoda*

**280S. Intellectuals/Culture/History: Modern China in Transition.** (AL, CZ) Debates over politics, ideology, high culture, and popular culture in China since the 1920s. Topics include: Marxism, the cultural Revolution; the modernist narratives of "world history"; the postmodern turn of debunking universal history; the 1990s' resurgence of Mao Zedong fever, the Chinese search for modernity, the revival of neo-nationalism and new conservatism; and state sponsorship and the new meanings of "culture as leisure." (Same as Asian and African Languages and Literature 180S but requires extra assignments.) One course. *Staff*

**288S. Seminar on Modern Chinese Cinema.** (CZ, FL) Films, documentaries, television series, and soap operas produced in mainland China in the post-Mao era. Topics include the history and aesthetics of the cinema, soap operas as the new forum for public debates on popular culture, the emerging film criticism in China, the relationship of politics and form in postrevolutionary aesthetics. (Same as Chinese 188S but requires extra assignments.) Prerequisites: Chinese 184S or advanced oral and written proficiency in Mandarin Chinese. One course. *Wang*

### Courses Currently Unscheduled

72. War, Gender, and Postcoloniality. (AL)

138. The Media in Modern India. (CZ, SS)

148S. Literature and Revolution: From the May Fourth to the Post-Mao Era. (AL)

149. Women and Modernity: Gender Issues in Twentieth-Century Chinese Literature and Film. (AL)

164. Premodern Japanese Literature. (AL)

170. The *I Ching*, or *Book of Changes*. (CZ)

171. Women and Creativity. (AL)

172S. South Asia in Poetry. (AL)

173S. Women in Arab Literature. (AL)

177. South Asian Women's Literature. (AL)

199. Asian and African Languages and Literature Honors Seminar.

203S. Gender and War. (CZ)

207S. Against Textual Hegemony: Voicing Theory from the Margins. (AL)

### ARABIC (ARB)

1, 2. Elementary Arabic. (FL) Understanding, speaking, reading, and writing modern standard Arabic. Language laboratory. One course each. *Cornell*

63, 64. Intermediate Arabic. (FL) Reading, composition, and conversation in modern standard Arabic. Readings include selections from the Qur'an, contemporary literature, and the Arabic press. One course each. *Cornell*

125, 126. Advanced Arabic. (AL, FL) Readings in classical and contemporary fiction and nonfiction. Works include al-Jahiz, Ibn Arabi, Taha Husain, Ibn Battuta, Ghada al-Samman and *1001 Nights*. Prerequisite: Arabic 64 or equivalent. C-L: Comparative Area Studies. One course each. *Cooke*

137. Qur'anic Studies. (FL) Introduction to the reading, recitation, grammatical study, and exegesis of selected Qur'anic texts. Prerequisite: Arabic 63, 64 or consent of instructor. One course. *Cornell*

183, 184. Topics in Arabic. (AL, FL) Readings and other material, including films, television, and radio broadcasts. Exercises in composition. Prerequisite: Arabic 126 or consent of instructor. C-L: Comparative Area Studies. One course each. *Cornell*

191, 192. Independent Study. One course each. *Cooke or Cornell*

## Courses Currently Unscheduled

### 100. North African Culture. (AL)

#### CHINESE (CHN)

**1, 2. Elementary Chinese. (FL)** Introduction to speaking, understanding, reading, and writing modern standard Chinese (Mandarin, or *putonghua*, based on the Beijing dialect). One course each. *Lee*

**1A. Abridged Elementary Chinese. (FL)** Fundamentals of spoken and written modern standard Chinese (Mandarin). Intended for post-baccalaureate and summer session students. Consent of instructor required. One course. *Staff*

**2A. Abridged Elementary Chinese II. (FL)** Prerequisites: Chinese 1A and consent of instructor. One course. *Staff*

**4, 5. Elementary Chinese Conversation. (FL)** Introduction to spoken Mandarin Chinese with emphasis on basic conversational style. This course supplements Chinese 1, 2 (Elementary Chinese). Students taking Chinese 1, 2 are required to take this course. Half course each. *Lee and staff*

**6, 7. Literacy in Chinese. (FL)** An alternative to Chinese 1, 2 for fluent speakers of modern standard Chinese (Mandarin) with little or no reading and writing ability, who wish to make sufficient progress in two semesters to advance to Chinese 125 in the fall semester. One course each. *Yao-Lahusen or staff*

**63, 64. Intermediate Chinese. (FL)** Reading, oral practice, language laboratory. One course each. *Lee and staff*

**125, 126. Advanced Chinese. (CZ, FL)** Proficiency in speaking, aural comprehension, reading, and writing. Content drawn from newspaper articles, essays, and other readings concerning history, culture, and current political, social, and simple economic issues in China, Taiwan, and Hong Kong. Prerequisite: Chinese 63, 64 or equivalent. C-L: Comparative Area Studies. One course each. *Yao-Lahusen*

**181, 182. Readings in Modern Chinese. (CZ, FL)** Readings of newspapers, short stories, and prose. Exercise in composition. Background in both complex and simplified forms of writing required. Prerequisite: Chinese 125, 126, 127, 129, or consent of instructor. One course each. *Staff*

**183S. Topics in Modern Chinese. (FL)** Readings and other material, including films, television, and radio broadcasts. Exercises in composition. Prerequisite: Chinese 125, 126, 127, 129, or consent of instructor. C-L: Comparative Area Studies. One course. *Staff*

**184S. Topics in Modern Chinese. (AL, FL)** Readings of modern short stories and essays on special topics of the cultural politics in modern and contemporary China. Additional materials such as films and television. C-L: Comparative Area Studies. One course. *Staff*

**188S. Seminar on Modern Chinese Cinema. (CZ, FL)** Films, documentaries, television series, and soap operas produced in mainland China in the post-Mao era. Topics include the history and aesthetics of the cinema, soap operas as the new forum for public debates on popular culture, the emerging film criticism in China, the relationship of politics and form in postrevolutionary aesthetics. Prerequisites: Chinese 184S or advanced oral and written proficiency in Mandarin Chinese. One course. *Wang*

**191, 192. Independent Study.** One course each. *Wang and staff*

*Courses Offered in the Duke Study in China Program at Capital Normal University*

111A. Intensive Progress in Spoken Chinese—Intermediate Level. (FL) One course. *Staff*

111B. Intensive Progress in Reading Chinese—Intermediate Level. (FL) One course. *Staff*

112A. Intensive Progress in Spoken Chinese—Advanced Level. (FL) One course. *Staff*

112B. Intensive Progress in Reading Chinese—Advanced Level. (FL) One course. *Staff*

127A. Special Topics in Conversation and Composition—Intermediate Level. (FL) Discussion based on oral and written reports and topical readings. Aural comprehension practice. One course. *Staff*

127B. Special Topics in Reading—Intermediate Level. (FL) Reading and discussion of selections from modern Chinese literature, expository prose, and the Chinese press. One course. *Staff*

129A. Special Topics in Conversation and Composition—Advanced Level. (CZ, FL) Discussion based on oral and written reports and topical readings. Aural comprehension practice. One course. *Staff*

129B. Special Topics in Reading—Advanced Level. (CZ, FL) Reading and discussion of selections from modern Chinese literature, expository prose, and the Chinese press. One course. *Staff*

193. Directed Study on Contemporary China. (FL) Research and field studies culminating in a paper approved and supervised by the resident director. Includes field trips on cultural and societal changes in contemporary China. One course. *Staff*

**Courses Currently Unscheduled**

171. The Chinese Novel: *Dream of the Red Chamber*. (AL, FL)

185S, 186S. Seminar on Contemporary China. (CZ, FL)

**HEBREW (HEB)**

1, 2. Elementary Modern Hebrew. (FL) Introduction to speaking, understanding, reading, and writing modern Hebrew. Language laboratory. C-L: Judaic Studies. One course each. *Zakim*

63, 64. Intermediate Modern Hebrew. (FL) Reading, composition, conversation, and language laboratory. Prerequisite: Hebrew 1, 2 or equivalent. C-L: Judaic Studies. One course each. *Zakim*

125S, 126S. Advanced Modern Hebrew. (AL, FL) Introduction to modern Hebrew literature and Israeli culture. Emphasis on critical reading of literary and cultural texts, including prose, poetry, drama, and film. Conducted in Hebrew. Prerequisite: Hebrew 64 or equivalent. C-L: Judaic Studies. One course each. *Zakim*

191, 192, 193, 194. Independent Study. C-L: Judaic Studies. One course each. *Staff*

**HINDI (HIN)**

1, 2. Elementary Hindi. (FL) Conversation, basic grammar, and vocabulary; introduction to the Devanagari script and the reading of graded texts. Four hours of classroom work; two hours of language laboratory drill. One course each. *Khanna*

4, 5. Elementary Hindi Conversation. (FL) Spoken Hindi with emphasis on basic conversational style. This course supplements Hindi 1, 2 (Elementary Hindi). Students



taking Hindi 1, 2 are required to take this course. Pass/fail grading only. Half course each. *Staff*

**63, 64. Intermediate Hindi. (FL)** Reading, composition, and conversation. Four hours of classroom work, two hours of language drill. Prerequisites: Hindi 1 and 2. One course each. *Khanna*

**125, 126. Advanced Hindi. (AL, FL)** Proficiency in reading, writing, and speaking. Prerequisite: Hindi 63, 64 or equivalent. One course each. *Khanna*

**183, 184. Topics in Hindi. (AL, FL)** Readings in prevailing literary and mass media forms. Prerequisite: Hindi 126 or consent of instructor. C-L: Comparative Area Studies. One course each. *Khanna*

**191, 192. Independent Study.** Directed reading and research. Open only to students with prior knowledge of Hindi. One course each. *Khanna*

## **JAPANESE (JPN)**

**1, 2. Elementary Japanese. (FL)** Introduction to speaking, listening, reading, and writing. One course each. *Endo*

**63, 64. Intermediate Japanese. (FL)** Practice on advanced grammar; speaking, reading, and writing. One course each. *Endo*

**125, 126. Advanced Japanese. (AL, FL)** Readings and other materials, including video. Exercises in composition and conversation. C-L: Comparative Area Studies. One course each. *Yanagida*

**183S, 184S. Topics in Japanese. (AL, FL)** Readings and other materials, including television and radio broadcasts. Exercises in composition. Consent of instructor required. C-L: Comparative Area Studies. One course each. *Ching*

**191, 192. Independent Study.** One course each. *Staff*

**193, 194. Independent Study.** One course each. *Staff*

**205S, 206S. Seminar in Japanese. (AL, FL)** Topics vary each semester. Prerequisite: Japanese 184 or equivalent. One course each. *Yoda*

**291. Research Methods in Japanese. (SS)** Introduction to various research approaches to literary, sociological, and historical studies of Japan. Emphasis on bibliographical sources that best serve needs in chosen area of specialization. Consent of instructor required. C-L: Cultural Anthropology 290, History 292, Political Science 291, and Sociology 291. One course. *Staff*

## **KOREAN (KOR)**

**1, 2. Elementary Korean. (FL)** Introduction to speaking, understanding, reading, and writing Korean. One course each. *Son-Yarbrough*

**63, 64. Intermediate Korean. (FL)** Spoken and written Korean. One course each. *Son-Yarbrough*

**125, 126. Advanced Korean. (CZ, FL)** Proficiency in speaking, aural comprehension, reading, and writing. Prerequisite: Korean 63, 64 or equivalent. C-L: Comparative Area Studies. One course each. *Staff*

**183, 184. Topics in Korean. (AL, FL)** Readings and other materials, including television and radio broadcasts. Exercise in composition. Essays on special topics of the cultural aspects in modern and contemporary Korea. Consent of instructor required. C-L: Comparative Area Studies. One course each. *Staff*

**191, 192. Independent Study.** One course each. *Staff*

## **PERSIAN (PER)**

### **Courses Currently Unscheduled**

**1, 2. Elementary Persian. (FL)**

**63, 64. Intermediate Persian. (FL)**

**101, 102. Introduction to Persian Literature. (AL, FL)**

## **SWAHILI (SWA)**

**1, 2. Elementary Swahili. (FL)** Swahili language and culture with emphasis on conversation. Intensive work in language laboratory; drill sessions with native speakers. One course each. *Sinamenye*

**63, 64. Intermediate Swahili. (FL)** Continuation of Swahili 1 and 2. Emphasis on contemporary Swahili literature. One course each. *Sinamenye*

**191, 192. Independent Study.** One course each. *Staff*

## **THE MAJOR**

Asian and African Languages and Literature offers a curriculum that reflects an increasing awareness of the interconnectedness of the globe. It provides students with an understanding of languages, literatures, and cultures beyond America and the West to prepare them for professional work or advanced graduate study in a number of international arenas. The curriculum is based on a theoretical perspective that examines contemporary national and ethnic cultures of Asia and Africa within a global context. Its mission is to foster a view of literature and culture at once indigenous and global, informed by local histories of internal development as well as by theories of cross-cultural influence. The course requirements for the major provide an intellectual vision that includes both study of language and culture practice and a critical theoretical framework for analyzing cultural experience.

The major requires a minimum of ten courses (at least eight of which must be at the 100-level or above), with concentration in one of the three following areas: Arabic, Chinese, or Japanese. Students wishing to concentrate in Hindi, modern Hebrew, or Korean should consider taking a minor in Asian and African Languages and Literature. The major is organized in accordance with three overlapping structures, as reflected in the following requirements:

- I. *Within the area of concentration*, the student will acquire advanced linguistic skills in Arabic, Chinese, or Japanese language and a comprehensive knowledge of a single culture related to each language. The major provides exposure to different methodologies for interpreting an indigenous literary and cultural tradition. Six (6) semester courses are required for this category. They include: (1) four language courses (63, 64, 125, 126 or above) at the intermediate and advanced level; (2) two courses at or above the 100-level on the literature or culture of the target language, one of which may be taken from another department. Majors should consult with their Chinese, Japanese, or Arabic advisors using a list of suggested courses.
- II. *Within the larger framework of Asian and African Languages and Literature*, the student is required to complete three (3) semester courses as follows: Introduction to Asian and African Literature and Culture (Asian and African Languages and Literature

121), the Senior Seminar (Asian and African Languages and Literature 200S), and one Asian and African Languages and Literature course outside the student's language of concentration (for example, the study of another AAL language or literature). Both Asian and African Languages and Literature 121 and 200S introduce a theoretical perspective grounded in continual cross-cultural dialogues between the cultures of Asia and Africa. All three courses aim at helping the student to establish cross-cultural links with students concentrating in other Asian and African languages.

- III. The major in Asian and African Languages and Literature also requires students to analyze critically the issue of indigenous cultural identities. The program fosters a view of literature and culture that is at once local and global. This view draws on theoretical inquiries into indigenous cultural identities associated with such conceptual categories as gender, class, ethnicity, nation, aesthetics, and sexuality. Therefore, every student is required to complete a one (1) semester course at or above the 100 level, not originating in the Asian and African Languages and Literature program on literary and cultural theory, that includes an examination of the above conceptual categories. Students should consult with their advisors in choosing a course appropriate to their own plan of study and to their capstone experience.

*Study Abroad.* An integral part of the student's experience will be study abroad; while not a requirement of the major, it is strongly encouraged. Students should discuss this option as early as possible with their major advisor.

*Advising.* Majors will be assigned two faculty advisors (one from the literature faculty and one from the faculty of the practice) in their area of concentration. The final papers for the senior seminar will be prepared in consultation with the major advisors and a faculty member outside the field of concentration.

*Graduation with Distinction.* Majors with grade point averages of 3.3 or higher may apply in their junior year to the director of undergraduate studies for graduation with distinction (see the section on honors in this bulletin). Students working on their honors thesis will meet together at the beginning of the spring semester of their senior year to report on their research topics and again toward the end of that semester to make a final presentation on their projects. In order to graduate with honors, the student must obtain at least an A- in the honors seminar.

## THE MINOR

A minor is offered to students interested in the study of language, literature, and culture of a particular region of Asia and Africa. Areas of concentration include: Arabic, Chinese, modern Hebrew, Hindu or Japanese.

The minor offers two tracks: (1) Concentration in an Asian and African Languages and Literature language and (2) Asian and African Languages and Literature. Five courses are required in each track.

(1) *Minor in an Area of Language Concentration:* includes Arabic, Chinese, modern Hebrew, Hindi, or Japanese. *Prerequisites:* two semesters of introductory language courses or the equivalent. *The Minor:* Four language courses beyond the level of 02. (Students are expected to take 63, 64, 125, and 126; however, students with proficiency of intermediate level or higher must take 183 and 184, or upper-level reading courses, for example, Chinese 181, Japanese 205, 206, Arabic 137, or independent studies courses to fulfill the four-course requirement). One 100-level Asian and African Languages and Literature or culture course in translation, open to all students without language prerequisites.

(2) *Minor in Asian and African Languages and Literature.* *Prerequisites:* two semesters of introductory language courses or the equivalent. *The Minor:* two language courses at the

intermediate level (63 and 64) or above; one 100-level Asian and African Languages and Literature course in translation on the literature or culture of the area of concentration; (3) one 100-level course in another Asian and African Languages and Literature language, literature, or culture outside of the language of concentration; (4) Asian and African Languages and Literature 121 (Introduction to Asian and African Literature and Culture).

## Astronomy

For courses in astronomy, see Physics.

## Biochemistry

For courses in biochemistry, see Medicine (School)—Graduate (School) Basic Science Courses Open to Undergraduates; also see Biology and Chemistry majors.

## Biological Anthropology and Anatomy (BAA)

Professor Kay, *Chair*; Assistant Professor Churchill, *Director of Undergraduate Studies*; Professors Cartmill, Glander, Hylander, Simons, Terborgh, and van Schaik; Associate Professors Roth and Smith; Assistant Professors Bassett, Pope, and White; Associate Professor Emeritus Duke; Assistant Research Professors Brockman, Digby, and M. Spencer; Adjunct Professor Larsen; Adjunct Associate Professor Wright; Adjunct Assistant Professors Anderson and Overdorff; Instructor Johnson; Research Scientists Crissey, L. Spencer, and Struhsaker; Research Associates Ankel-Simons, Bouvier, Madden, Schmitt, Wall, and Williams; Lecturing Fellow Chatrath

A major or minor is available in this department.

Biological Anthropology and Anatomy is an interdisciplinary department centering on the origin and evolution of human beings and their close biological relatives. The department and its course offerings have three general focuses: primate behavior and ecology, primate paleontology, and functional and comparative anatomy. Significant opportunities for independent research are found at the Duke Primate Center, which houses a unique and diverse range of nonhuman primates, especially prosimians from Madagascar. Advanced students can study original fossils and casts at the Primate Center and in the department's laboratories in the Medical Center, which also afford opportunities to study comparative anatomy from an adaptive and evolutionary perspective. Students interested in the Primatology Program should be aware that Biological Anthropology and Anatomy 93D is a program requirement. For further information on the Primatology Program contact the program chair at the department.

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**50S. Human Biological Evolution. (NS)** An overview of the fossil and archaeological evidence for human biological evolution. The development over the last two centuries of the principles used to interpret biological evolution, with particular emphasis given to the role these principles played in interpreting the earliest finds of fossil humans. Review of the primate fossil record; detailed treatment of hominid fossil materials. Open only to students in the FOCUS Program, Evolution and Humankind. One course. *Spencer*

**93. Introduction to Biological Anthropology. (NS)** Origins and distribution; primate evolution; a survey of human paleontology and human biology, prehistory, and language; and the origins of human social organization and culture. One course. *Staff*

**93D. Introduction to Biological Anthropology. (NS)** Same as Biological Anthropology and Anatomy 93 except instruction is provided in lectures and one small laboratory meeting each week. One course. *Staff*



**132. Human Evolution.** (NS) Evolutionary biology of the primates. Anatomical and behavioral adaptations and phylogeny of fossils and living primates including *Homo sapiens*. Prerequisites: Biological Anthropology and Anatomy 93 or equivalent. One course. *Cartmill, Glander, Simons, or staff*

**133L. The Human Body.** (NS) Human gross anatomy seen from a functional and evolutionary perspective. Laboratory involving study of prosected cadavers and other anatomical preparations. Prerequisites: Biological Anthropology and Anatomy 93. One course. *Cartmill, White, or staff*

**134L. Anthropology of the Skeleton.** (NS) An introduction to the basics of human osteological analysis. Identification and siding of all the bones of the human body and the major osteological landmarks on each bone; basics of bone histology, development and growth; and fundamentals of anthropological analysis of human skeletal remains (archeological treatment of burials; determination of gender, populational affinities, stature; paleopathological analysis; medicolegal applications). Prerequisites: Biological Anthropology and Anatomy 93 or Biology 25L. One course. *Churchill*

**135. Human Functional Anatomy.** (NS) Basics of functional morphology (including elementary biomechanics), an overview of connective tissue structure and mechanics, and a systematic overview (from head to toe) of human anatomy from a functional perspective. Emphasis on connective and other tissues involved in functioning of the musculoskeletal system (primarily bone, cartilage, tendons, ligaments, and muscle). Prerequisites: Biological Anthropology and Anatomy 93 and 133L or Biological Anthropology and Anatomy 134L. One course. *Churchill*

**136. Human Biology.** (NS) An introduction to human biology from an evolutionary perspective. Focus on biological variability and its genetic and ecological underpinnings, with an emphasis on modern human variation and adaptation. Principles of heredity, development, evolution, adaptation, population growth and regulation, and epidemics; examples from various human populations. Prerequisites: Biological Anthropology and Anatomy 93 or Biology 25L. One course. *Churchill*

**137. Ecology and Adaptation of Hunters and Gatherers.** (NS) The ecology of extant and extinct foraging societies; focus on human behavioral solutions to subsistence problems associated with different environments (tropical/neotropical forest, boreal forest, coastal, arctic, grassland/savannah, desert). Topics include edible resource distribution in varied environments and its relationship to mobility and subsistence strategies in modern hunter-gatherers; and the archeological and fossil evidence for the evolution of human subsistence behavior. Prerequisites: Biological Anthropology and Anatomy 93 or Biology 25L. One course. *Churchill*

**143. Primate Ecology.** (NS) A survey of primate ecology and behavior. Prerequisites: Biological Anthropology and Anatomy 93 or consent of instructor. One course. *Glander, Simons, van Schaik, White, or staff*

**144L. Primate Field Biology.** (NS) Survey of field methods used to document primate behavior. Laboratory includes observations of free-ranging primates at the Duke Primate Center. Prerequisites: Biological Anthropology and Anatomy 93 or Biology 25L. One course. *Pope or staff*

**146. Sociobiology.** (NS) Sociobiological theory reviewed and applied to the social behavior of nonhuman primates, hominids, and humans. Prerequisites: Biological Anthropology and Anatomy 93. C-L: Study of Sexualities. One course. *van Schaik*

**151. Anatomy of the Lower Extremities.** (NS) Introduction to the functional anatomy of the lower extremities. Consent of instructor required. One course. *Bassett*

**172L. Primate Anatomy. (NS)** The comparative anatomy of primates from the perspective of adaptation and phylogeny. Laboratory includes some dissection or prosection of human and nonhuman primates. Prerequisites: Biological Anthropology and Anatomy 93. One course. *Kay or staff*

**180. Current Issues in Biological Anthropology and Anatomy. (NS)** Selected topics in methodology, theory, or area. One course. *Staff*

**180L. Current Issues in Biological Anthropology and Anatomy. (NS)** Same as Biological Anthropology and Anatomy 180 except in laboratory format. One course. *Staff*

**180S. Current Issues in Biological Anthropology and Anatomy. (NS)** Same as Biological Anthropology and Anatomy 180 except in seminar format. One course. *Staff*

**183. Primate Social Complexity and Intelligence. (NS)** Information on primate social behavior and cognition used to examine ideas on the origins and functions of primate intelligence. Topics include communication, "ape language," alliances and reciprocity, deception and social manipulation, and the extent of awareness inferable from behavior in the wild and from experiments in captivity. Prerequisites: Biological Anthropology and Anatomy 93 or Biology 25L. One course. *Staff*

**184. Primates and Tropical Forest Conservation. (NS)** Main concepts of conservation biology, both at the species and community level, focusing on tropical rain forest habitats and primates. Relevant aspects of biogeography, ecology and demography; tropical deforestation, causes and consequences; conservation strategies (objectives, design of protected area networks, threats). One course. *van Schaik*

**185. Current Issues in Primatology. (NS)** Selected topics in primate behavior, ecology, and conservation. Consent of instructor required. One course. *Staff*

**193. Independent Study.** Directed reading and research culminating in a written report. Open only to qualified juniors or seniors, who, before being given permission to register, must submit to the faculty advisor a written proposal outlining the area of study and listing the goals and meeting schedule. One course. *Staff*

**195S, 196S. Senior Seminar.** Prerequisites: BAA 93, a 100-level course in biological anthropology and anatomy, and consent of director of undergraduate studies. One course each. *Staff*

### **For Seniors and Graduates**

**238S. Functional and Evolutionary Morphology of Primates. (NS)** History and functional significance of locomotor and feeding adaptations, craniofacial morphology, sense organs, and reproductive systems in primates, including *Homo sapiens*. Consent of instructor required. Prerequisites: Biological Anthropology and Anatomy 172L or equivalent. One course. *Cartmill, Kay, or staff*

**240S. Hominid Socioecology. (NS)** Analysis of how socioecological studies of human foragers and nonhuman primates can inform the interpretation of the hominid fossil/archaeological record. Summary of documented historical changes during hominid evolution, and identification of approaches required to develop testable reconstructions. Models for the evolution in hominids of bipedalism, ranging and foraging, hunting, food sharing, intersexual relationships and sexual division of labor, communication (includes language), culture, technology, life history, parental care, and social organization, as well as their mutual relationships. Prerequisites: Biological Anthropology and Anatomy 93(D) or 132. One course. *van Schaik*

**244L, S. Comparative Primate Ecology. (NS)** Comparisons of the evolutionary ecology of prosimians, monkeys, and apes. Field methods. Prerequisites: Biological Anthropology and Anatomy 93; Biological Anthropology and Anatomy 143 recommended. One course. *Glander or White*

**245S. Primate Social Evolution. (NS)** Ecological determinants of, and biological constraints on, social strategies and systems. Emphasis on primates. Prerequisites: Biological Anthropology and Anatomy 93; 143, 144L, or 146; or consent of instructor. One course. *van Schaik*

**246. The Primate Fossil Record. (NS)** A survey of fossil primates including early humans. The diversity, anatomy, and behavior of primates as related to the origin and spread of past primates. The radiation of each main group of primates in the succession leading to humans illustrated with slides, casts, and fossils. Topics include geochemical dating, timing of molecular clocks, and various procedures for classifying primates. Prerequisites: Biological Anthropology and Anatomy 93 or consent of instructor. One course. *Simons*

**247. The Hominid Fossil Record. (NS)** Origin and successive stages of development of human ancestors. Detailed analysis of adaptive types and cultural developments. Personalities and current controversies in the study of hominid paleontology. Prerequisites: Biological Anthropology and Anatomy 93, 132, or consent of instructor. One course. *Simons*

**248S. Evolution of Mammals. (NS)** The origin, adaptive radiation, and phylogenetic relationships of mammals, as inferred from the fossil record. Consent of instructor required. One course. *Staff*

**249S. Microevolution and Sociobiology. (NS)** The relationship between resource distribution, social structure, and rate and direction of evolutionary change, including speciation. Mating systems, dispersal patterns, and mechanisms of new social group formation examined from the perspective of their effects on the genetic structure of populations and species radiations. Prerequisites: Biological Anthropology and Anatomy 93 or Biology 25L; Biology 120 recommended. One course. *Pope*

**250. Biometry. (QR)** A practically oriented overview of the statistical analysis of biological data. Topics include data collection and experimental design, methods and techniques of data organization, use of computing programs and packages, applications of appropriate parametric and nonparametric statistical techniques, assumptions and problems encountered with biological data analysis, and interpretation of results. Prerequisites: Mathematics 136, Psychology 117, Sociology 133, Statistics 10D, 110, 112, 114, 213, or equivalent, and consent of instructor required. One course. *White*

**280L, 281L. Special Topics Laboratory. (NS)** Special topics in methodology, theory, or area. Consent of instructor required. One course each. *Staff*

**280S, 281S. Seminar in Selected Topics. (NS)** Special topics in methodology, theory, or area. Consent of instructor required. One course each. *Staff*

**287S. Macroevolution. (NS)** Evolutionary patterns and processes at and above the species level; species concepts, speciation, diversification, extinction, ontogeny and phylogeny, rates of evolution, and alternative explanations for adaptation and evolutionary trends. Prerequisite: Biology 25L or equivalent. C-L: Biology 287S, Botany 287S, and Zoology 287S. One course. *Roth*

**289L. Comparative Mammalian Anatomy. (NS)** A practical survey of anatomical diversity in mammals. An emphasis on dissections of a broad variety of mammals. A broader perspective on specific anatomical features provided in the lectures. One course. *Staff*



**292S. Topics in Morphology and Evolution. (NS)** Various aspects of vertebrate morphology and evolution, including major historical approaches to the interpretation of morphology; the evolution, development, and function of specific morphological structures; and patterns of vertebrate evolution. Consent of instructor required. One course. *Smith*

#### **COURSES CURRENTLY UNSCHEDULED**

**290. Pattern and Process in Vertebrate Development. (NS)**

**293, 294. Evolutionary Theory. (NS)**

#### **THE MAJOR**

##### **For the A.B. Degree**

*Prerequisite.* Biological Anthropology and Anatomy 93 or 93D.

*Corequisites.* Biology 25L or equivalent.

*Major Requirements.* Nine courses are required, not including the above prerequisites and corequisites, distributed in the following manner:

—Biological Anthropology and Anatomy 132.

—At least four courses numbered 100 or above selected from the Biological Anthropology and Anatomy present course listings.

—At least four other courses numbered 100 or above in Biological Anthropology and Anatomy or approved courses numbered 100 or above in other social and biological sciences departments.

##### **For the B.S. Degree**

*Prerequisite.* Biological Anthropology and Anatomy 93 or 93D.

*Corequisites.* Biology 25L or equivalent; Chemistry 11L, 12L, and 151L; Mathematics 31 and 32; Physics 51L and 52L, or 53L and 54L.

*Major Requirements.* Eight courses numbered 100 or above are required in the biological and geological sciences, not including the above prerequisites and corequisites. Of these eight courses, at least five courses must be selected from the Biological Anthropology and Anatomy present course listings; up to three courses in other biological sciences, psychology, or geology, approved by the advisor. One of these eight courses must include related laboratory/field experience; an independent study course or the research internship or seminar in primatology may be counted toward the/field experience requirement, if appropriate. At least one of the courses must concern statistics or quantitative methods (Biological Anthropology and Anatomy 250, Statistics 100 level or Psychology 117, or equivalent). At least two of these eight courses must be at the 200 level. Some courses in geology are strongly encouraged for students with interests in paleontology.

#### **Graduation with Distinction**

Qualified majors are encouraged to participate in special work leading to graduation with distinction in biological anthropology and anatomy. See the section on honors in this bulletin for general requirements. Any major with a B+ average (3.3 grade point average) in biological anthropology and anatomy courses and with a B average (3.0 grade point average) in all courses is eligible. Students who desire to undertake honors work should request a member of the biological anthropology and anatomy faculty to recommend their names to the director of undergraduate studies. To receive departmental honors a major must complete a paper involving significant independent research or scholarship and pass an oral examination on the paper conducted by an appointed committee of faculty members, at least two of whom should be in biological anthropology and anatomy. Normally, students will prepare their papers over the course of the senior year working in close collaboration with their committees and receiving on the average two course credits in independent study for the work.



## THE MINOR

*Requirements.* Biological Anthropology and Anatomy 93 or 93D; one course (from approved list) in comparative anatomy or paleontology; one course (from approved list) in behavior and ecology; two elective courses, numbered 100 or above, in Biological Anthropology and Anatomy. The director of undergraduate studies may approve other courses to satisfy requirements in two subfields.

## Biology (BIO)

**Faculty in Botany:** Professor Stone, *Chair*; Associate Professor Kohorn, *Director of Undergraduate Studies in Biology*; Professors Antonovics, Barber, Boynton, Christensen, Ramus, Reynolds, Schlesinger, Searles, Siedow, Terborgh, White, and Wilbur; Associate Professors Knoerr, Shaw, and Vilgalys; Assistant Professors Bohs, Clark, Dong, Honma, Sperry, and Sun; Professors Emeriti Anderson, W. Culberson, Hellmers, Naylor, and Strain; Assistant Professor of the Practice Armaleo; Research Professor C. Culberson; Associate Research Professor Harris; Adjunct Professors Funk, Kress, Osmond, Rogers, and Wagner; Adjunct Associate Professors Lacey, Swofford, and Zimmer; Adjunct Assistant Professor DePriest, Adjunct Professor of the Practice Hartshorn; Instructor L. Kohorn

**Faculty in Zoology:** Professor Rausher, *Chair*; Lecturer Grunwald, *Associate Director of Undergraduate Studies in Biology*; Professors Barber, Brandon, Forward, Gillham, Laurie, Livingstone, McClay, Nicklas, H. Nijhout, Simons, Staddon, Terborgh, Tucker, Uyenoyama, and Vogel; Associate Professors Nowicki, Rittschof, Roth, K. Smith, and Van Schaik; Assistant Professors Alberts, Crenshaw, Crowder, Cunningham, Fehon, McShea, Morris, and Wilson; Professors Emeriti Bailey, Bookhout, Fluke, Gregg, Kolpfer, Schmidt-Nielsen, Wainwright and Ward; Associate Professor of the Practice Motten; Assistant Professor of the Practice Mercer; Assistant Research Professors Einstein, Roach, and Smyth; Adjunct Professor Schmidt-Koenig; Adjunct Associate Professor M. Nijhout; Lecturer Lincoln

A major is available in biology.

The biology courses and the biology major are cooperatively administered by the Department of Botany and the Department of Zoology. Additional courses in bio-sciences are offered by the Departments of Biological Anthropology and Anatomy, Chemistry, and Psychology in Trinity College of Arts and Sciences; by the basic sciences departments in the School of Medicine; and by the School of Engineering and the Nicholas School of the Environment.

Biology 25L constitutes the normal introductory course for students planning to major in the biological sciences and is a prerequisite for intermediate and advanced courses in biology. For nonmajors, this course may count for the area requirement in the natural sciences. Biology 19 also meets the introductory requirement by advanced placement and Biology 20L by transfer credit.

**10L. Marine Biology. (NS)** Physical and chemical characteristics of marine ecosystems and the functional adaptations of marine organisms to these systems. Lectures, field trips, and laboratories. For students not majoring in a natural science. (Given at Beaufort.) C-L: Marine Sciences. One course. *Kenney*

**19. General Biology.** Credit for Advanced Placement on the basis of the College Board Examination in biology. Equivalent to Biology 25L as prerequisite. One course.

**20L. Introductory Biology. (NS)** Credit for introductory biology by transfer of college-level work not corresponding to Biology 25L in content, but including laboratory work. May be counted toward Natural Sciences Area of Knowledge. One course.

**25L. Principles of Biology. (NS)** Introductory course for students planning to major in biology and for students in other majors intending to pursue a postgraduate degree in the life sciences. Provides an integrated overview of biology, covering basic principles in cell and molecular biology, energy transport, development, physiology, genetics, microevolution, macroevolution, and ecology. One course. *Nowicki*

**31L. Diversity of Life. (NS)** Integrated survey of biological diversity covering all five kingdoms—Monera, Protista, Plantae, Fungi, and Animalia—from an evolutionary and functional perspective. Emphasis on phylogenetic relationships for examining distinctive characteristics of each kingdom and major groups within kingdoms. Laboratory exercises coordinated with lectures with emphasis on live material to present ecological and functional anatomical features of wide variety of representative taxa. Field trips to distinctive habitats in North Carolina. May be taken before Biology 25L. Not open to students who have taken Biology 32L. One course. *Motten and Roth*

**32L. Defining Moments in Organismal Evolution. (NS)** The evolution of organismal diversity can be viewed as a series of important events through time. Defining moments include the evolution of photosynthesis, eukaryotic life, sexual recombination, variation in life-history, and multicellularity. Examples from the five kingdoms considered in a phylogenetic context. Historical relationships among organisms discussed using evidence from morphology, gene sequences, and biogeography. Laboratory includes inventory of organismal diversity and practical exercises to study historical relationships. Not open to students who have taken Biology 31L. One course. *Cunningham and Manos*

**43D. Ecology and Society. (NS)** Ecological concepts and their application to human society. Intended for nonscience majors. One course. *L. Kohorn*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**50. Life's Beginnings. (NS)** Cells, molecules, and evolution from the start. The origin and evolution of life on earth as a case study in science, as a human enterprise, and as a way of knowing. Intended for non-biology majors. One course. *Nicklas*

**53. Introductory Oceanography. (NS)** Basic principles of physical, chemical, biological, and geological oceanography. Fee for required field trip to the Marine Laboratory. C-L: Earth and Ocean Sciences 53. One course. *Corliss, Lozier, Pilkey (geology), and Searles*

**90. Plants and Civilization. (NS)** The origins, history, and botanical relationships of economic plants and their interface with people, evolution of domesticated plants, and the origins of agriculture. One course. *Bohs*

**93S. FOCUS Program Topics in Biology. (NS)** Open only to students in the FOCUS Program; for first-year students with consent of instructor. One course. *Staff*

**101. Biogeography in an Australian Context. (NS)** Distribution of plants and animals in space and time as determined by the interaction of geophysics, geology, climate, and evolutionary history. Special emphasis on the unique terrestrial and marine faunas and floras of the Australian continent. One course. *Searles*

**102. Trees and Shrubs of North Carolina. (NS)** Identification and natural history of the trees, shrubs, and woody vines. Emphasis on those cultivated or occurring naturally in North Carolina. One course. *Wilbur*

**103L. General Microbiology. (NS)** Classical and modern principles of the structure, physiology, and genetics of microorganisms and their roles in human affairs. Prerequisite: one course in a biological science or consent of instructor. One course. *Dong, Siedow, or Vilgalys*

**108L. Developmental and Comparative Anatomy of Vertebrates. (NS)** The embryology, anatomy, and evolutionary development of vertebrate organ systems. Prerequisite: Biology 25L. One course. *Staff*

**110L. Ecology. (NS)** Physical, chemical, and biological processes that determine the distribution and abundance of plants and animals, emphasizing physiological responses, population dynamics, species interaction, biogeography, nutrient cycling, and energy flow through food webs. Laboratory includes fieldwork. Prerequisites: Biology 25L and Mathematics 31. One course. *Livingstone, Reynolds, or Schlesinger*

**112. Population Biology. (NS)** How and why the abundances of animals and plants change in space and time. Growth of human and other populations, ecological interactions between populations (competition, predation, and mutualism), and conservation of threatened populations. Prerequisites: Biology 25L and Mathematics 31. One course. *Morris*

**114L. Biological Oceanography. (NS)** Physical, chemical, and biological processes of the oceans, emphasizing special adaptations for life in the sea and factors controlling distribution and abundance of organisms. One course (spring); one and one-half courses (summer). (Given at Beaufort and Bermuda.) Prerequisite: Biology 25L. C-L: Marine Sciences. Variable credit. *Ramus or staff (Beaufort); Nelson and Steinberg (Bermuda)*

**118. Principles of Genetics and Cell Biology I. (NS)** Structure and function of genes and proteins in organisms ranging from bacteria to humans. Topics include: physical properties of DNA and chromosomes; protein structure and function; transcription and translation of genetic information; segregation, recombination, and linkage of genes; evolution of genes and proteins; identification and cloning of genes; regulation of gene expression; postranslational control of protein function; manipulating protein expression and function through genetic engineering. Prerequisites: Biology 25L and Chemistry 12L. C-L: Genetics. One course. *B. Kohorn or Laurie*

**119. Principles of Genetics and Cell Biology II. (NS)** The role of genes and proteins in mediating basic cellular and developmental processes. Topics include: structure and function of cellular membranes and organelles; protein targeting and transport; signal transduction; role of the cytoskeleton in cell shape and motility; function of the immune system; genetic regulation of cell growth/division and the relationship to cancer; genetic control of developmental processes. Prerequisite: Biology 118. C-L: Genetics. One course. *Fehon and McClay*

**120. Principles of Evolution. (NS)** Evidence for evolution; mechanisms of micro- and macro-evolutionary change. Genetic change in populations. Ecological, behavioral, molecular forces influencing genetic change. Speciation; phylogenetic reconstruction. Prerequisite: Biology 25L. One course. *Antonovics, Rausher, or Roth*

**121. Evolution of Animal Form. (NS)** A survey of the history of animal life focusing on major revolutions in design such as the Cambrian explosion, the Mesozoic radiation of dinosaurs, and the Cenozoic radiation of mammals. The exploration of three views of form: the Darwinian view, which stresses function; the historicist view, which emphasizes historical accident; and the structuralist view that form is mainly the result of fixed mathematical relationships. The different ways in which each view applies the comparative method. Prerequisite: Biology 25L. One course. *McShea*

**123. Analysis of Ocean Ecosystems. (NS)** The history, utility, and heuristic value of the ecosystem; ocean systems in the context of Odum's ecosystem concept; structure and function of the earth's major ecosystems. (Given at Beaufort.) Prerequisite: one year of biology, one year of chemistry, or consent of instructor. C-L: Marine Sciences. One course. *Barber*



**126. Marine Mammals. (NS)** Ecology, social organization, behavior, acoustic communication, and management issues. Focus on marine mammals in the southeastern United States (for example, bottlenose dolphin, right whale, West Indian manatee). (Given at Beaufort.) Prerequisite: introductory biology. C-L: Marine Sciences. One course. *Read or staff*

**126L. Marine Mammals. (NS)** Laboratory version of Biology 126. Laboratory exercises consider social organization and acoustic communication in the local bottlenose dolphin population. (Given at Beaufort.) Prerequisite: introductory biology. C-L: Marine Sciences. One course. *Read or staff*

**129L. Marine Ecology. (NS)** Factors that influence the distribution, abundance, and diversity of marine organisms. Course structure integrates lectures, field excursions. Topics include characteristics of marine habitats, adaptation to environment, species interactions, biogeography, larval recruitment, and communities found in rocky shores, tidal flats, beaches, mangrove, coral reefs, and subtidal areas. Not open to students who have taken Zoology 203L. (Given at Beaufort fall and summer and at Bermuda, spring.) Prerequisite: introductory biology. C-L: Marine Sciences. One course. *Crowder or Kirby-Smith (Beaufort); Lipschultz, McKenna, and Smith (Bermuda)*

**134. Fundamentals of Tropical Biology. (NS)** Conceptual themes in ecology, emphasizing tropical organisms and ecosystems. Topics range from behavioral and physiological adaptation of individuals to processes and patterns in diverse assemblages, including: mutualism and parasitism in the tropics, competition and the structure of tropical guilds, pollination ecology, forest dynamics and gap-phase regeneration, island biogeography and the design of biological reserves, and evolutionary processes responsible for promoting high tropical biodiversity. (Taught in Las Cruces, Costa Rica.) Prerequisite: Biology 25L or equivalent. One course. *Shelley*

**135L. Research Methods in Tropical Biology. (NS)** Field-based course stressing student design and implementation of ecological projects in tropical habitats. Introduces basic concepts in statistical populations, sampling techniques, and experimental design and hypothesis testing. Topics include: measuring abiotic micro- and macroclimatic variables; estimating population abundance and distribution; performing demographic and life history analyses; investigating mutualistic, competitive, and predator-prey coevolutionary processes; and measuring patterns of species diversity. Demonstrates different ecological zones. (Taught in Las Cruces, Costa Rica.) Prerequisite: Biology 25L or equivalent. One course. *Staff*

**140L. Plant Diversity. (NS)** Major groups of living plants, their evolutionary origins and phylogenetic relationships. Fee for field trip. Prerequisite: Biology 25L or equivalent. One course. *Bohs or Searles*

**142L. Plant Systematics. (NS)** Surveys major groups. Principles of vascular plant taxonomy with practice in identification of local flora. Lectures, laboratories, and field trips. One course. *Wilbur*

**149. Comparative Biomechanics. (NS)** The structure and operation of organisms in relation to the mechanics of solids and fluids. Prerequisites: Mathematics 31 and Physics 51L or equivalents. One course. *Vogel*

**150L. Physiology of Marine Animals. (NS)** Environmental factors, biological rhythms, and behavioral adaptations in the comparative physiology of marine animals. One course (fall); one and one-half courses (summer). (Given at Beaufort.) Prerequisites: Biology 25L and Chemistry 12L. C-L: Marine Sciences. Variable credit. *Forward*



**151L. Principles of Animal Physiology.** (NS) Functional aspects of respiration, circulation, neural and hormonal coordination, water balance, metabolism, thermoregulation, and responses to special environments. Prerequisites: Biology 25L and Chemistry 12L. One course. *Crenshaw, Grunwald, or Tucker*

**152. Molecular Basis of Plant Functioning.** (NS) Principal physiological processes of plants, including respiration, photosynthesis, water relations, and factors associated with plant morphogenesis. Prerequisites: Biology 25L and Chemistry 12L; organic chemistry is desirable. One course. *Siedow and Sun*

**154. Principles of Neurobiology.** (NS) Introduction to neuroscience, including: basic physiology; microstructure and anatomy of neural tissues; mechanisms of neuronal development and integration; sensory-motor control; the neural foundations of animal behavior; and the evolution of nervous systems. Prerequisites: Biology 25L, and Chemistry 12L or equivalent. C-L: Neurobiology 154, Neurosciences, and Psychology 135. One course. *LaMantia or Nowicki*

**155L. Biochemistry of Marine Animals.** (NS) Functional, structural, and evolutionary relationships of biochemical processes of importance to marine organisms. One course (fall and spring); one and one-half courses (summer). (Given at Beaufort.) Prerequisites: Biology 25L; and Chemistry 11L, 12L. C-L: Marine Sciences. Variable credit. *McClellan-Green (spring); Rittschof (fall and summer)*

**158L. Introduction to Modern Microscopy.** (NS) A hands-on approach to teach students how to use the new microscopy with an emphasis on the principles underlying their application. Prerequisite: Biology 25L. One course. *Crenshaw*

**176L. Marine Invertebrate Zoology.** (NS) Structure, function, and development of invertebrates collected from estuarine and marine habitats. Not open to students who have taken Zoology 274L. One course (fall, spring, and Summer Term II); one and one-half courses (Summer Term I). (Given at Beaufort fall and summer or at Bermuda, spring.) Prerequisite: Biology 25L. C-L: Marine Sciences. Variable credit. *Dimock (Beaufort) or Kirby-Smith (Beaufort); Barnes and Coates (Bermuda)*

**184L. Experimental Cell and Molecular Biology.** (NS) Experimental approaches to contemporary questions in cell and molecular biology. Practical laboratory training in molecular genetics, protein chemistry and other methods used in the rapidly developing field of biotechnology. Experiments include cloning and sequencing genes, characterizing gene regulation and exploring protein structure/function relationships and subcellular localization. Prerequisite: Biology 118 or 119. C-L: Genetics. One course. *Armaleo, Boynton, Dong, B. Kohorn, Laurie, Siedow, or Sun*

**185L. Experiments in Development and Molecular Genetics.** (NS) Experimental approaches in development and genetics using animal and plant models. Laboratory training in molecular genetics, immunochemistry, microscopy, protein chemistry, and genetic screening. Experiments include immunochemical localization, in situ hybridization, polymerase chain reaction genetic screening, embryo micromanipulation, microscopic imaging, and mutant analysis. Prerequisite: Biology 118; recommended, prior or concurrent registration in Biology 119. C-L: Genetics. One course. *Fehon, Honma, Lincoln, or McClay*

**191, 192. Independent Study.** Open to all qualified students with consent of supervising instructor and director of undergraduate studies. A maximum of three courses of 191, 192, 193T, and 194T may count toward the biology major. One course each. *Staff*

**193T, 194T. Tutorial.** For junior and senior majors with consent of director of undergraduate studies and supervising instructor. Three courses of 191, 192, 193T, and 194T, maximum. One course each. *Staff*

**195S, 196S. Seminar in Biology.** (NS) Variable credit. *Staff*

### **For Seniors and Graduates**

**201L, S. Animal Behavior.** (NS) Survey of past developments and current controversies in animal behavior. Extensive readings, followed by individual experimental or descriptive projects in the laboratory or field (or Primate Center). Recommended background: Biology 25L, Biology 151L, and statistics, or equivalents. One course. *Klopfer*

**206S. Controversies in Biology.** (NS) A contentious theme for reading, discussion, and an individual or joint paper. Illustrative past topics: the nature of the creative process, causality in biological thought, the lack of political impact of many scientific developments. Open to nonmajors. One course. *Klopfer*

**212L, S. Phycology.** (NS) Morphological and ecological characteristics of common freshwater and marine algae and principles of their classification. One course. *Searles*

**215. Tropical Ecology.** (NS) Ecosystem, community, and population ecology of tropical plants and animals with application to conservation and sustainable development. Prerequisite: a course in general ecology. C-L: Environment 217. One course. *Terborgh*

**216L. Limnology.** (NS) Lakes, ponds, and streams; their origin, development, geochemistry, energy balance, productivity, and the dynamics of plant and animal communities. Laboratory includes field trips. Offered biennially. Prerequisites: Biology 25L, Chemistry 12L, Mathematics 32, and physics; or equivalents; or consent of instructor. One course. *Livingstone*

**218L. Barrier Island Ecology.** (NS) An integration of barrier island plant and animal ecology within the context of geomorphological change and human disturbance. Topics include: barrier island formation and migration, plant and animal adaptations, species interactions, dune succession, maritime forests, salt marshes, sea level rise, conservation policy, and restoration ecology. Field trips to many of the major North Carolina barrier islands. Strong emphasis on field observation and independent research. (Given at Beaufort.) Prerequisite: Biology 25L or equivalent; suggested: course in botany or ecology. C-L: Environment 218L and Marine Sciences. One course. *Evans, Peterson, and Wells (visiting summer faculty)*

**220L. Mycology.** (NS) Survey of the major groups of fungi with emphasis on life history and systematics. Field and laboratory exercises. One course. *Vilgalys*

**222L. Entomology.** (NS) The biology of insects: diversity, development, physiology, and ecology. Field trips. Prerequisite: Biology 25L or equivalent. One course. *H. Nijhout*

**225T. Special Problems.** (NS) Consent of instructor required. Half course. *Staff*

**229L, S. Paleocology.** (NS) Global change over the last two million years. Prerequisites: two semesters of biology or geology; and one semester each of calculus, chemistry, and physics; or consent of instructors. One course. *Clark and Livingstone*

**232. Microclimatology.** (NS) Introduction to the micrometeorological processes. Discussion of the integration of these processes and the resulting microclimates in the rural (forest, field, and water surface) and urban environments. Methods for modification of the microclimate. C-L: Environment 232. One course. *Knoerr*

**234S. Problems in the Philosophy of Biology.** (NS) Consent of instructor required. See C-L: Philosophy 234S. One course. *Brandon*

**237L. Systematic Biology.** (NS) Theory and practice of identification, species discovery, phylogeny reconstruction, classification, and nomenclature. Prerequisite: Biology 25L or equivalent. One course. *Manos, Swofford, and Vilgalys*

**241. Field Botany. (NS)** Identification and recognition of the vascular flora of the Carolinas. Frequent field trips to representative habitats. Prerequisite: introductory plant identification course or consent of instructor. One course. *Wilbur*

**242L. Field Botany of North Carolina's Wetlands. (NS)** A survey of the flora of North Carolina's wetland habitats with emphasis on plant identification in the field. Field trips to mountain, piedmont, and coastal wetlands. Examination of all groups of plants including bryophytes, ferns, and seed plants. Wetland habitats include swamps, bogs, pocosins, and brackish sites. Information on the floristics of the southeastern United States botanical nomenclature, systematic relationships of wetland plants, and an overview of wetland vegetation. Prerequisite: one course in plant diversity or systematics, or consent of instructor. C-L: Environment 237L. One course. *Shaw and Wilbur*

**243L. Evolution and Classification of Angiosperms. (NS)** Characteristics and phylogenetic relationships of major flowering plant lineages. Emphasis on current literature, rigorous methods, modern controversies, and biological and biogeographic implications of relationships. Prerequisite: Biology 142L or equivalent. One course. *Funk, Kress, and Manos*

**244. Principles of Immunology. (NS)** An introduction to the molecular and cellular basis of the immune response. Topics include anatomy of the lymphoid system, lymphocyte biology, antigen-antibody interactions, humoral and cellular effector mechanisms, and control of immune responses. Prerequisites: Biology 119 and Chemistry 151L or equivalents. C-L: Immunology 244. One course. *Kostyu (immunology), McClay, and staff*

**250L. Form, Function, and Adaptation of Plants. (NS)** The structural and developmental basis for the major functions of the plant body including energy harvest, mechanical support, transport, and storage. Structural adaptations to important environmental stresses. Emphasis on underlying biomechanical/physical principles. Prerequisite: Biology 25L; suggested: either Biology 110L, 140L, 149, or 152. C-L: Environment 250L. One course. *Sperry*

**257L. Molecular Systematics and Evolution. (NS)** Descriptive and experimental procedures used to assess evolutionary diversity for analysis of population genetics and systematic relationships. Laboratory problems, discussion, and individual research projects. Prerequisites: basic course work in systematics, evolution, and genetics. One course. *Vilgalys*

**265L. Physiological Plant Ecology. (NS)** The physiological approach to interpreting adaptation in plants, with emphasis on terrestrial seed plants. Prerequisites: Biology 110L and 152 or equivalents. One course. *Staff*

**267L. Community Ecology. (NS)** Mechanisms that determine the distribution and abundance of plants and animals: geology, climate, physiography, soils, competition, predation, and history. Lectures focus on ecological principles. Seminars and weekend field trips. Prerequisites: an introductory ecology course and consent of instructor. One course. *Christensen or Clark*

**272. Biogeochemistry. (NS)** Processes controlling the circulation of carbon and biochemical elements in natural ecosystems and at the global level, with emphasis on soil and surficial processes. Prerequisite: Chemistry 12L or equivalent. C-L: Earth and Ocean Sciences 272. One course. *Schlesinger*

**281. DNA, Chromosomes, and Evolution. (NS)** The relationship of chromosome and DNA-sequence organization with evolution; karyotype changes and speciation; repetitive DNA, split genes, transposable elements, and evolutionary mechanisms; phylogeny reconstruction; evolution of mitosis and the chromosome cycle. Prerequisite: an introductory course in genetics or cell or molecular biology, or consent of instructor. C-L: Genetics. One course. *Laurie and Nicklas*



**284. Molecular Population Genetics.** (NS) Theoretical and computational basis of evolutionary biology at the sequence level. Models of nucleotide and amino acid substitution; distance measures; distance methods for phylogeny reconstruction; tests of neutrality, adaptive selection, and hitchhiking; methods for distinguishing between common ancestry and adaptation; case histories of molecular evolution. For graduate students and upper-level undergraduates with coursework in genetics or evolution or mathematics. One course. *Uyenoyama*

**285S. Ecological Genetics.** (NS) Interaction of genetics and ecology and its importance in explaining the evolution, diversity, and distribution of plants and animals. Prerequisites: Biology 120 and consent of instructor. C-L: Genetics. One course. *Antonovics*

**286. Evolutionary Mechanisms.** (NS) Population ecology and population genetics of plants and animals. Fitness concepts, life history evolution, mating systems, genetic divergence, and causes and maintenance of genetic diversity. Prerequisites: Biology 25L and 120 or equivalents. C-L: Genetics. One course. *Antonovics, Rausher, and Uyenoyama*

**287S. Macroevolution.** (NS) Evolutionary patterns and processes at and above the species level; species concepts, speciation, diversification, extinction, ontogeny and phylogeny, rates of evolution, and alternative explanations for adaptation and evolutionary trends. Prerequisite: Biology 25L or equivalent. C-L: Biological Anthropology and Anatomy 287S. One course. *Roth*

**288. Mathematical Population Genetics.** (NS) Principles of formulation and analysis of dynamic mathematical models of genetic evolution. Rotating topics include: mating systems, sex ratio, stochastic processes. Prerequisites: calculus; statistics and linear algebra recommended. C-L: Genetics. One course. *Uyenoyama*

**289L. Methods in Morphometrics.** (QR) Techniques for the acquisition and analysis of quantitative data for describing and comparing biological form. Topics include: image capture and analysis; two- and three-dimensional digitization; and multivariate and geometric techniques such as allometric analysis, outline and landmark-superposition methods, and deformation models. Background in statistics and linear algebra recommended. One course. *Mercer*

**291. Mathematical Biology.** (NS) An introduction to mathematical biology. Topics drawn from population biology, epidemiology, enzyme kinetics, chemotaxis, and developmental biology. Emphasis on robust methods for obtaining useful information from biological models. Methods include graphical, geometric, perturbation, and stability analysis. Prerequisites: Mathematics 103 or equivalent and consent of instructor. One course. *Mercer*

**293. Simulating Ecological and Evolutionary Systems.** (NS) Computer programming using C within a UNIX environment applied to ecological and evolutionary problems. The relationship between simulation and analytic modeling. Knowledge of programming or work within the UNIX computer environment not expected. Consent of instructor required. One course. *Wilson*

**294. Successes in Theoretical Ecology and Evolution.** (NS) Case studies in theoretical ecology and evolution with direct application to empirical systems. Includes mating systems, life history strategies, population dynamics, and infectious diseases. Prerequisites: Biology 25L and 120 or equivalents. One course. *Wilson*

**295S, 296S. Seminar.** (NS) Variable credit. *Staff*



## COURSES CURRENTLY UNSCHEDULED

- 100. Perspectives on Living Systems. (NS)
- 113L. Behavioral Ecology. (NS)
- 164D. Developmental Biology. (NS)
- 256L. S. Plant Biosystematics. (NS)
- 261. Photosynthesis. (NS)
- 269. Advanced Cell Biology. (NS)
- 283. Molecular Genetics of Organelles. (NS)
- 290. Pattern and Process in Vertebrate Development. (NS)

## THE MAJOR

The Bachelor of Arts and the Bachelor of Science degrees are offered with a major in biology or in an individually designed interdepartmental concentration approved by the director of undergraduate studies in biology. Information may be obtained in the office of the director of undergraduate studies.

### For the A.B. Degree

This degree program is the general liberal arts major program. Students contemplating a career in biological or biomedical sciences should elect the program leading to the B.S. degree. A minimum of sixteen courses is required for this major.

*Prerequisites.* Biology 25L, or equivalent.

*Corequisites.* Chemistry 11L, 12L; Mathematics 25, 26 or 31, 32; plus three science-related courses outside the biological sciences selected from an approved list of such courses.

*Major Requirements.* A minimum of eight full courses in at least eight course registrations in the biosciences, not including the above prerequisites and corequisites or courses specified not for science majors; two of these courses must include related laboratory experience; one laboratory independent study course may be counted toward the laboratory requirement. The eight courses must include one core course from each of four areas: cell biology and genetics (Biology 118); diversity; organismal structure and function; and ecology, evolution, and systematics. These courses are prerequisites to many of the advanced courses in these subject areas. Six of these eight courses must be in biology. The remaining courses may be elected from among courses numbered 100 or above in biology; or from approved courses in the basic science departments of the School of Medicine; or from approved courses of a basic biological character in related departments. The elective courses acceptable for a biology major with an area of concentration (see below) are defined by the requirements for that concentration. At least one of these eight courses must be at the 200 level in biology or an approved alternate.

### For the B.S. Degree

This is the program in biology for students contemplating a career in biological or biomedical sciences. A minimum of seventeen courses is required for this major.

*Prerequisites.* Biology 25L, or equivalent.

*Corequisites.* Chemistry 11L, 12L, and 151L; Mathematics 31, 32; Physics 51L or 53L and 52L or 54L. Additional corequisites may be required for particular areas of concentration (see below).

*Major Requirements.* A minimum of nine full courses in at least nine course registrations in the biosciences, not including the above prerequisites and corequisites or courses specified not for science majors; two of these courses must include related laboratory experience; one laboratory independent study course may be counted toward the laboratory requirement. The nine courses must include five core courses: a two semester sequence in cell biology and genetics (Biology 118 and 119); and one core course from each of three areas: diversity;

organismal structure and function; and ecology, evolution, and systematics. These courses are prerequisites to many of the advanced courses in these subject areas. Seven of these nine courses must be in biology. The remaining courses may be elected from among courses numbered 100 or above in biology, or from approved courses in the basic science departments of the School of Medicine, or from approved courses of a basic biological character in related departments. The elective courses acceptable for a biology major with an area of concentration (see below) are defined by the requirements for that concentration. At least one of these nine courses must be at the 200 level in biology or an approved alternate.

### **For Areas of Concentration**

Students may elect to complete requirements in specified areas of concentration. Currently available areas of concentration in the biology major are: animal behavior, biochemistry, cell and molecular biology, ecology, evolutionary biology, genetics, marine biology, neuroscience, pharmacology, and plant systematics. For information on areas of concentration see the director of undergraduate studies.

### **The Negotiated Major**

Students with unusual interests in biology may arrange a negotiated concentration of study. After appropriate discussion with departmental faculty, a student may devise a program of study which must be endorsed by two members of the faculty and approved by the director of undergraduate studies. The statement of the proposed program must make clear why the negotiated major is more appropriate than a conventional major. Such a program must be arranged before the start of a student's fifth semester. The only formal limitation on this approach to the major is that it include at least five courses in biology to meet minimum Trinity College requirements.

### **Graduation with Distinction**

Biology majors who achieve excellence in both their studies and a research-based thesis may apply for Graduation with Distinction in Biology. Students may apply if they have an overall grade point average of 3.0 or above in biology courses at the time of application. The award of Distinction requires the completion of an original research project, usually carried out as an independent study in biology (Biology 191, 192) or in an appropriate biological science department at Duke University. The application for Distinction must be endorsed by the student's research supervisor. Distinction will be awarded by a three-member faculty committee based on an oral poster presentation and the written thesis. Only a single level of distinction is offered in Biology. See the director of undergraduate studies for more details.

## **Botany (BOT)**

Professor Stone, *Chair*; Associate Professor Kohorn, *Director of Undergraduate Studies in Biology*; Professors Antonovics, Barber, Boynton, Christensen, Ramus, Reynolds, Schlesinger, Searles, Siedow, Terborgh, White, and Wilbur; Associate Professors Knoerr, Shaw, and Vilgalys; Assistant Professors Bohs, Clark, Dong, Honma, Sperry, and Sun; Professors Emeriti Anderson, W. Culberson, Hellmers, Naylor, and Strain; Assistant Professor of the Practice Armaleo; Research Professor C. Culberson; Associate Research Professor Harris; Adjunct Professors Funk, Kress, Osmond, Rogers, and Wagner; Adjunct Associate Professors Lacey, Swofford, and Zimmer; Adjunct Assistant Professor DePriest, Adjunct Professor of the Practice Hartshorn; Instructor Kohorn

See Biology for a description of the major and the list of courses taught by the botany faculty.

## Canadian Studies (CAN)

Professor Thompson (history), *Director*; Professors Davis (history), Gereffi (sociology), Healy (environment), Kornberg (political science), Mignolo (romance studies), O'Barr (cultural anthropology), Paletz (political science), Richardson (environment), J. Smith (sociology), Tiryakian (sociology), Vidmar (law), Warren (community and family medicine), and Wood (history); Associate Professors French (history), Kimbrough (economics), and Mayer (public policy); Assistant Professors Clarke (English), Jonaissaint (romance studies), and Shanahan (sociology); Professors Emeriti Cahow (history), Maddox (sociology), Preston (history), and Tuthill (economic geography); Associate Professor Emeritus Hull (romance studies); Research Professor Davidson (English); Associate Research Professor Keineg (romance studies); Adjunct Professor Steen (environment); Adjunct Associate Professor Wilson (history)

A second major or a minor is available in this program.

The program in Canadian Studies seeks to provide the student with an understanding of Canada. Students may undertake the program to supplement another major, or to complete a second major in Canadian Studies, or as part of an interdepartmental concentration, or under Program II. Canadian Studies may also be an area concentration in the comparative area studies major, described elsewhere in this bulletin. See sections below on the program, the major, and the minor. The courses are described in the departmental and interdisciplinary listings.

### CANADIAN STUDIES COURSES (CAN)

**98. Introduction to Canada.** (SS) History, economy, society, politics, and institutions of Canada. C-L: Comparative Area Studies, Economics 98, History 98, Political Science 98, and Sociology 98. One course. *Staff*

**184S. Canadian Issues.** (SS) Persistent and current issues facing the Canadian nation-state, among them: cultural and regional political divisions, Indian-Euro-Canadian relations, the development of the Canadian welfare state, Canada's place in the international community and in the world economy. Prerequisite: Canadian Studies 98 or consent of instructor. C-L: Comparative Area Studies, Cultural Anthropology 184S, Economics 184S, History 184S, Political Science 184S, and Sociology 184S. One course. *Staff*

**185S. The Canadian Health Care System.** (SS) The Canadian health care system from its historical roots: social, political, legal, and economic aspects. An examination of how the system works from the point of view of society, the professional community, and the government. Comparative material included. C-L: Comparative Area Studies, Cultural Anthropology 185S, Economics 185S, History 108E, Political Science 185S, Public Policy Studies 187S, and Sociology 185S. One course. *Warren*

**282S. Canada.** (SS) A research seminar for advanced students familiar with Canada. Topics vary each semester; recent perspectives have included nationalism, Canadian-American relations, regionalism in the Maritimes and the West, and cross-border environmental issues, among others. C-L: Comparative Area Studies, Cultural Anthropology 282S, Economics 282S, History 282S, Political Science 282S, and Sociology 282S. One course. *Staff*

### DEPARTMENTAL COURSES

The following courses count as one course in the five required for the minor in Canadian Studies and in the ten required for the major in Canadian Studies. Independent studies may also be arranged with Canadian Studies faculty.

### **African and African-American Studies**

123. Modernity, Ethnicity, and Colonization. (Cross-listed.) *Mignolo or staff*  
138. Francophone Literature. (Cross-listed.) *Jonassaint or staff*

### **Asian and African Languages and Literature**

168. Francophone Literature. (Cross-listed.) *Jonassaint or staff*

### **Cultural Anthropology**

110. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*  
130. Modernity, Ethnicity, and Colonization. (Cross-listed.) *Mignolo or staff*  
184S. Canadian Issues. (Cross-listed.) *Staff*  
185S. The Canadian Health Care System. (Cross-listed.) *Warren*  
282S. Canada. (Cross-listed.) *Staff*

### **Economics**

98. Introduction to Canada. (Cross-listed.) *Staff*  
184S. Canadian Issues. (Cross-listed.) *Staff*  
185S. The Canadian Health Care System. (Cross-listed.) *Warren*  
265S. International Trade. *Tower*  
282S. Canada. (Cross-listed.) *Staff*

### **English**

120. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*  
186A. S. Canadian Literature in English. (Cross-listed.) *A. Davidson*

### **French**

168. Francophone Literature. (Cross-listed.) *Jonassaint or staff*  
169. The Contemporary Novel in French Canada. (Cross-listed.) *Keineg*

### **History**

98. Introduction to Canada. (Cross-listed.) *Staff*  
108C. Canadian-American Relations. (Cross-listed.) *Thompson*  
108D. Across the Great Divides: The United States and Canadian Wests in the Nineteenth and Twentieth Centuries. *Thompson*  
108E, S. The Canadian Health Care System. (Cross-listed.) *Warren*  
119A, 119B. Native American History. (Cross-listed.) *Wood*  
121B. The United States as a World Power: 1861-1941. *Staff*  
183S. Canada from the French Settlement. (Cross-listed.) *Thompson*  
184S. Canadian Issues. (Cross-listed.) *Staff*  
281S. United States' Diplomacy since 1945. *Staff*  
282S. Canada. (Cross-listed.) *Staff*

### **Literature**

163. The Canadian Image: Cultural Production in French and English Canada. (Cross-listed.) *A. Davidson*

### **Political Science**

98. Introduction to Canada. (Cross-listed.) *Staff*  
180. Media in Comparative Perspective (B). (Cross-listed.) *Staff*  
184S. Canadian Issues (B). (Cross-listed.) *Staff*  
185S. The Canadian Health Care System (B). (Cross-listed.) *Warren*  
203S. Issues in Politics and the Media in the United States (A). (Cross-listed.) *Paletz*  
266. Comparative Social Policy (B). (Cross-listed.) *Staff*  
277. Comparative Party Politics (B). (Cross-listed.) *Lange*  
282S. Canada (B). (Cross-listed.) *Staff*

### **Public Policy Studies**

- 187S. The Canadian Health Care System. (Cross-listed.) *Warren*  
266. Comparative Social Policy. (Cross-listed.) *Staff*

### **Romance Studies**

124. Modernity, Ethnicity, and Colonization. (Cross-listed.) *Mignolo or staff*

### **Sociology**

98. Introduction to Canada. (Cross-listed.) *Staff*  
160. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*  
170. Mass Media. (Cross-listed.) *Staff*  
171. Comparative Health Care Systems. (Cross-listed.) *Staff*  
182. Media in Comparative Perspective. (Cross-listed.) *Staff*  
184S. Canadian Issues. (Cross-listed.) *Staff*



185S. The Canadian Health Care System. (Cross-listed.) *Warren*  
282S. Canada. (Cross-listed.) *Staff*

## SPECIAL TOPICS COURSES

### English

49S. Writing the Native in Canadian, U.S., Australia, and New Zealand Fiction. *Davidson*  
131. Margaret Atwood. *Davidson*  
170. North American Literature. *Clarke*

### French

141S. Twentieth-Century Novel in French, Canada and Quebec. *Keineg*

### History

196S. U.S. and Canadian Agrarian Movements. *Staff*

## THE MAJOR

*Prerequisite:* Canadian Studies 98.

*Corequisite:* Completion of another major; two years of college-level French.

*Major Requirements.* Ten courses with Canadian content, including Canadian Studies 98 and 184S and eight additional courses, seven of which must be at the 100 level or above. Some of the course requirements may be fulfilled by independent study or special readings courses. No more than four courses required for the first major may be counted for a Canadian Studies major. In special cases, an aboriginal or "heritage" language may be substituted for the French requirement.

## THE MINOR

*Requirements.* Five courses with Canadian content; three must be at the 100 level or above; courses must include Interdisciplinary Canadian Studies 98 (Introduction to Canada) and 184S (Canadian Issues). Strong encouragement for equivalent of two years of college-level French or participation in summer program at L'Université du Québec à Trois Rivières.

For further information, contact the Director, 2016 Campus Drive.

## Cell Biology

For courses in cell biology, see Biology and Medicine (School)—Graduate (School) Basic Science Courses Open to Undergraduates.

## Chemistry (CHM)

Professor Baldwin, *Chair*; Professor Bonk, *Director of Undergraduate Studies and Supervisor of First-year Instruction*; Professors Chesnut, Crumbliss, Lochmüller, McGown, McPhail, Palmer, Pirrung, Porter, Shaw, Simon, and Wells; Associate Professors Fierke (biochemistry), MacPhail, Oas (biochemistry) Toone, and Yang; Assistant Professors Grinstaff and Widenhoefer; Professors Emeriti Arnett, Bradsher, Hobbs, Poirier, Quin, Smith, Strobel, and Wilder; Adjunct Professors Ghirardelli and Kiserow; Adjunct Associate Professor Chao; Lecturers D'Silva and Woerner

A major or minor is available in this department. Courses with laboratories include fifty to sixty hours of laboratory work per term.

**11L, 12L. Principles of Chemistry. (NS)** The introductory course for students who intend to take additional chemistry courses other than Chemistry 83. 11L: emphasizes stoichiometry and atomic and molecular structures. 12L: emphasizes thermodynamics, chemical kinetics, synthesis, and analysis. Laboratory work includes both qualitative and quantitative analysis. Prerequisites: one year of high school chemistry or consent of instructor; Mathematics 19 or its equivalent; and for 12L: Chemistry 11L. One course each. *Bonk and staff*

**19. General Chemistry.** Credit for Advanced Placement on the basis of the College Board examination in chemistry. Equivalent to Chemistry 11L and 12L as prerequisite. One course.

**23L. Advanced General Chemistry.** (NS) An intensive introductory course for well-prepared students, covering in one semester the major topics of Chemistry 11L and 12L. Laboratory work includes both qualitative and quantitative analysis. Students may not receive credit for both Chemistry 23L and Chemistry 11L, 12L or Chemistry 31S. Prerequisites: Mathematics 19 or its equivalent; and two years of high school chemistry or consent of instructor. One course. *Grinstaff and staff*

**26S. Introduction to Research in Chemistry.** (NS) Active participation in chemistry (or chemistry related) research group, followed by seminar classes in which the research activities are discussed. Prerequisite: Chemistry 11L or 19. One course. *Staff*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**117. Inorganic Chemistry.** (NS) Bonding, structures, and reactions of inorganic compounds studied through physical chemical concepts. Prerequisite: Chemistry 161 or 162L. One course. *Crumbliss, Grinstaff, McPhail, Palmer, or Wells*

**131. Analytical Chemistry.** (NS) Fundamentals of qualitative and quantitative measurement with emphasis on chemometrics, quantitative spectrometry, electrochemical methods, and common separation techniques. Corequisite: Chemistry 133L. Prerequisite: Chemistry 163L. One course. *Lockmüller or McGown*

**133L. Analytical Chemistry Laboratory.** (NS) Laboratory experiments designed to accompany Chemistry 131. Corequisite: Chemistry 131. Half course. *Staff*

**151L, 152L. Organic Chemistry.** (NS) The structures and reactions of the compounds of carbon. Laboratory: techniques of separation, organic reactions and preparations, and systematic identification of compounds by their spectral and chemical properties. Prerequisite: Chemistry 12L, 23L, or 31S or consent of director of undergraduate studies; for 152L: Chemistry 151L. One course each. *Baldwin, Pirrung, Porter, Toone, or Widenhoefer*

**161. Physical Chemistry.** (NS) Fundamentals of theoretical chemistry with particular emphasis on chemical thermodynamics and kinetics. Chemistry 163L should be taken concurrently. Prerequisites: Chemistry 12L, Mathematics 32, and Physics 52L or 54L. One course. *Chesnut, MacPhail, McPhail, Simon, or Yang*

**162L. Physical Chemistry.** (NS) Fundamentals of theoretical chemistry with particular emphasis on quantum chemistry, molecular structure, and molecular spectroscopy. Laboratory. Prerequisite: Chemistry 12L, Physics 52L or 54L, Mathematics 32 or consent of instructor. One course. *Chesnut, MacPhail, McPhail, Simon, or Yang*

**163L. Physical Chemistry Laboratory.** (NS) Laboratory experiments designed to accompany Chemistry 161. Prerequisite: (or corequisite) Chemistry 161. Half course. *Staff*

**176. Biophysical Chemistry.** (NS) The physical chemical principles of and experimental methods employed in the study of biological macromolecules. Students may not receive credit for both Chemistry 176 and 196S. Prerequisite: Chemistry 161 or Biochemistry 227. One course. *Shaw*

**180L. Advanced Laboratory Techniques.** (NS) Synthesis of less common substances by techniques such as high or low pressure, high or low temperature, and/or inert atmospheres. Characterization of products from measurements such as electrical conductance, optical rotation, ultraviolet-visible spectra, infrared spectra, and/or mass spectra. Prerequisite: (or corequisite) Chemistry 117. Half course. *Staff*

**191, 192. Independent Study.** Supervised reading and research. Half or one course. Consent of instructor required. Variable credit. *Staff*

**193, 194. Independent Study.** Supervised reading and research. Prerequisites: Chemistry 191, 192, and consent of independent study coordinator. One course each. *Staff*

**195S, 198S. Seminar. (NS)** Half course or one course. Variable credit. *Staff*

**196S. Seminar. (NS)** Selected topics in physical chemistry of biological macromolecules. Students may not receive credit for both Chemistry 176 and 196S. Prerequisites: Chemistry 163L and 175 or Biochemistry 227. One course. *Shaw*

**197S. Seminar. (NS)** Special topics in biological chemistry (e.g., immunochemistry, molecular biology). Prerequisite: Chemistry 161; Chemistry 175 recommended. One course. *Staff*

### **For Seniors and Graduates**

**201. Molecular Spectroscopy. (NS)** Selected spectroscopic methods in the study of molecular structure. Symmetry and group theoretical basis for selection rules, theories of magnetic and optical resonance, and interpretation of spectra; examples from both inorganic and organic chemistry. Three lectures. Open to especially well-prepared undergraduates by consent of director of undergraduate studies. One course. *Baldwin, Grinstaff, Palmer, Pirrung, Shaw, Simon, and Widenhoefer*

**203. Quantum Chemistry. (NS)** Basic principles of quantum and group theoretical methods. Topics include symmetry and a review of the fundamentals and the mathematical foundations of quantum theory. Emphasis on the application of molecular orbital theory to organic and inorganic systems. Open to especially well-prepared undergraduates by consent of director of undergraduate studies. Prerequisite: Chemistry 162L. One course. *Chesnut, MacPhail, Pirrung, Porter, and Yang*

**205. Structure and Reaction Dynamics. (NS)** Structure and mechanisms in organic and inorganic compounds, substitution reactions, linear free energy relations, and molecular rearrangements. Emphasis on the use of kinetic techniques to solve problems in reaction mechanisms. Three lectures. Open to especially well-prepared undergraduates by consent of director of undergraduate studies. One course. *Crumbliss, Porter, Toone, and Wells*

**207. Principles of Kinetics, Thermodynamics, and Diffraction. (NS)** Three lectures. Open to especially well-prepared undergraduates by consent of director of undergraduate studies. One course. *Chesnut, MacPhail, McPhail, Simon, and Yang*

**209. Advanced Chemistry. (NS)** A combination of three one-third course segments from Chemistry 201, 203, 205, and 207. Interested students should consult the director of undergraduate studies for scheduling. Consent of director of undergraduate studies required. One course. *Staff*

**275, 276. Advanced Studies. (NS)** (1) Analytical chemistry, (2) inorganic chemistry, (3) organic chemistry, and (4) physical chemistry. Open to especially well-prepared undergraduates by consent of director of undergraduate studies. One course each. *Staff*

### **COURSES CURRENTLY UNSCHEDULED**

**31S. Advanced Chemical Fundamentals. (NS)**

**83. Chemistry and Society. (NS)**

**151M, 152M. Organic Chemistry. (NS)**

**152P. Preceptorial. (NS)**

**175. Molecular Basis of Biological Processes. (NS)**

## THE MAJOR

Differing major programs are offered under the baccalaureate degrees, including concentrations in the areas of biochemistry and environmental chemistry. The Bachelor of Arts degree programs permit greater flexibility in allowing students to select an area of concentration while satisfying the junior-senior small group learning experience requirements through seminar courses (option one) or through independent study in chemistry or related departments (option two). Of particular significance are the areas of emphasis (option three) including biology, mathematics, and physics. The Bachelor of Science degree program, accredited by the American Chemical Society, provides in-depth preparation for graduate study in chemistry.

### For the A.B. Degree

*Prerequisites.* Chemistry 11L, 12L (or 23L, 31S, or 19). Mathematics 31L, 32L (or 41); Physics 51L, 52L (or 53L, 54L).

*Major Requirements.* Chemistry 131 and 133L, 151L, 152L, 161 and 163L, plus one of the following three course options:

1. Three of the following: Chemistry 117, 162L, 176, 195S, 196S, 198S, Biochemistry 227, 228.
2. One of the following: Chemistry 117, 162L, Biochemistry 227, plus Chemistry 191, 192 or the equivalent in a natural science, mathematics, engineering, or a basic science department in the School of Medicine.
3. One of the following:
  - a. Physics emphasis. Chemistry 162L plus two of the following: Physics 143L, Physics 181, Physics 182.
  - b. Mathematics emphasis. Chemistry 162L plus two of the following: Mathematics 104, Mathematics 111, Mathematics 114, Mathematics 131.
  - c. Biology emphasis. Biochemistry 227 plus two of the following: Biology 118, Biology 151, Biology 152, Biology 184L, Biology 244.

In certain cases, substitutions may be made for courses outside the chemistry department with consent of the director of undergraduate studies.

*Recommendations.* Computer Science 6 or Engineering 51, Mathematics 103 (for options one and two), and Chemistry 162L. Students planning graduate study are advised to take these recommended courses and to consult with advisors regarding appropriate additional courses.

### For the B.S. Degree

*Prerequisites.* Chemistry 11L, 12L (or 23L, 31S, or 19). Mathematics 31, 32 (or 31L, 32L or 41); and Physics 51L, 52L (or 53L, 54L).

*Major Requirements.* Chemistry 117, 131, 133L, 151L, 152L, 161, 162L, 163L, 180L, plus three or four additional courses selected according to option 1, 2, or 3.

1. Three chemistry courses selected as follows.  
Chemistry 191, 192.  
*Plus:* Chemistry 176, 195S, 196S, 198S, 201, 203, 205, 207, 209, 275 or 276.
2. Two chemistry courses plus one approved course in another department selected as follows.  
At least one of the following: Chemistry 191 or 192.  
*Plus:* Chemistry 176, 195S, 196S, 198S, 201, 203, 205, 207, 209, 275 or 276.  
*Plus:* One lecture course in an approved science department in Trinity College, basic science of the School of Medicine, or in the School of Engineering.



3. Two chemistry courses plus two independent study courses in an approved department selected as follows.

At least two of the following: Chemistry 176, 191, 195S, 196S, 198S, 201, 203, 205, 207, 209, 275 or 276.

*Plus:* Two approved independent study courses in a science department in Trinity College, basic sciences of the School of Medicine, or in the School of Engineering.

Chemistry 201, 203, 205, and 207 are offered also in one-third semester segments; in some instances a student may wish to take some combination of three of these segments by registering for Chemistry 209. Additional details may be obtained from the director of undergraduate studies.

*Recommendations.* Mathematics 103, 104 and Physics 100. Students planning graduate study in chemistry should consult with advisors regarding appropriate additional courses.

### **The Concentration in Biochemistry**

In cooperation with the Department of Biochemistry in the School of Medicine, the chemistry department offers both an A.B. and a B.S. degree in chemistry with concentration in biochemistry. Certification of this concentration is designated on the official transcript.

#### **For the A.B. Degree with Concentration in Biochemistry**

*Prerequisite:* Chemistry 11L, 12L (or 23L, 31S, or 19); Mathematics 31, 32 (or 31L, 32L or 41); Physics 51L, 52L (or 53L, 54L); and Biology 25L.

*Major Requirements.* Chemistry 131/133L, 151L, 152L, 161/163L; Biochemistry 227, 228; plus one of the following: Chemistry 176, 191, 195S, 198S; Biology 118, 184L, 191; or any advanced course in biochemistry.

#### **For the B.S. Degree with Concentration in Biochemistry**

*Prerequisites.* Chemistry 11L, 12L (or 23L, 31S, or 19). Mathematics 31, 32 (or 31L, 32L or 41); Physics 51L, 52L (or 53L, 54L); and Biology 25L.

*Major Requirements.* Chemistry 117, 131/133L, 151L, 152L, 161/163L, 162L; Biochemistry 227, 228; Biology 118, 119; plus one of the following: Chemistry 191, Biology 191, or Biochemistry 209.

*Recommendations.* Mathematics 103; Chemistry 180L\*, 192, 195S, 198S; Biology 184L, 192; advanced courses in biochemistry.

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\*Majors who wish to earn a B.S. in chemistry that is certified by the American Chemical Society must include Chemistry 180L (half course).

### **The Concentration in Environmental Chemistry**

In cooperation with the School of the Environment, the chemistry department offers both an A.B. and a B.S. degree in chemistry with a concentration in environmental chemistry. Certification of the concentration is designated on the official transcript.

#### **For the A. B. Degree with Concentration in Environmental Chemistry**

*Prerequisites.* Chemistry 11L, 12L (or 23L, 31S, or 19); Mathematics 31, 32 (or 31L, 32L or 41); Physics 51L, 52L (or 53L, 54L); plus two of the following: Biology 25L, Geology 41, Geology 120.

*Major Requirements.* Chemistry 131 and 133L, 151L, 152L, 161 and 163L; Environment 241; either Environment 240 or 242; plus one of the following: Chemistry 117, 176, 191\*, 195S, 198S; Biology 110L; Environment 191, 243.

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\*The independent study project must involve some aspect of environmental chemistry.

## For the B.S. Degree in Chemistry with Concentration in Environmental Chemistry

*Prerequisites.* Chemistry 11L, 12L (or 23L, 31S, or 19); Mathematics 31, 32 (or 31L, 32L or 41); Physics 51L, 52L or (53L, 54L); plus two of the following: Biology 25L, Geology 41, Geology 120.

*Major Requirements.* Chemistry 117, 131 and 133L, 151L, 152L, 161 and 163L, 162L; Environment 241, either Environment 240 or 242, plus one of the following: Chemistry 191\*, Environment 191.

*Recommendations.* Chemistry 180L\*\*, 192, 195S, 198S; Mathematics 103, Biology 110L, Environment 192, 243.

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\*The independent study project must involve some aspect of environmental chemistry.

\*\*Majors who wish to earn a B.S. in chemistry that is certified by the American Chemical Society must include Chemistry 180L (half course).

## Graduation with Distinction

The department offers a program for graduation with distinction in chemistry. See the section on honors in this bulletin. The program involves two semesters of independent study, taken either in the chemistry department (Chemistry 191, 192) or, with the prior approval of the coordinator of independent study, in an appropriate science department in Trinity College, the School of Engineering, or the School of Medicine. A research paper based upon the independent study and nomination by the research supervisor form the basis for consideration by a departmental committee. The committee may recommend the student for graduation with distinction in chemistry.

## THE MINOR

*Requirements.* Chemistry 11L or 19; any four of the following courses: Chemistry 12L, any Chemistry courses at the 100 level or above, Biochemistry 227, Biochemistry 228, Environment 240, Environment 241, or Environment 242.

## Chinese

For courses in Chinese, see Asian and African Languages and Literature.

## Classical Studies (CS)

Professor Boatwright, *Chair*; Professor Younger, *Director of Undergraduate Studies*; Professors Burian, Clay, Connor, Davis, Oates, Rigsby, and Stanley; Associate Professor Janan; Professors Emeriti Newton, Richardson, and Willis; Adjunct Assistant Professor Cormack

Majors and minors are available in this department.

The objective of classical studies is to increase knowledge and understanding of the civilizations of Greece and Rome, part of the roots of Western culture. Toward this aim, the department offers courses in three areas (Latin, Greek, and classical studies) and two majors (classical languages, classical studies). Concentration in the languages offers students opportunities to explore at first hand the literature, history, and thought of antiquity. In the process of learning Greek and/or Latin, students will gain a deeper insight into language itself, as well as an appreciation of the problems of interpretation and the varieties of evidence upon which interpretation may be based. For students interested in history, ancient art, or archaeology, courses in classical studies offer a means of assessing the culture and the material remains of Greece and Rome in their own rich and varied context.

Students considering careers not in classical studies or a closely related discipline will also enjoy the benefits from either major offered by the department. The experience of analyzing language, literature, artifacts and architecture, and other ancient subjects will hone their intellectual abilities well for any profession, and perhaps especially for law and finance.

## GREEK (GRK)

**1-2. Elementary Greek. (FL)** A study of grammar and an introduction to reading. Two courses. *Staff*

**10. Accelerated First-Year Greek. (FL)** First year of ancient Greek in one semester. One course. *Burian*

**14S. Intensive Elementary Greek. (FL)** Introduction to the grammar, offered only in the summer; combining the work of Greek 1 and 2 in one course. Two courses. *Staff*

**15S. Intensive Intermediate Greek. (FL)** Combining the work of Greek 63 and 64 in one course, offered only in the summer; selected readings in prose and poetry. Two courses. *Staff*

**63, 64. Intermediate Greek. (FL)** Introduction to Greek prose and poetry. 63: Plato's *Republic*, *Apology*, or *Symposium*. 64: Euripides and Homer. One course each. *Staff*

**64A. Intermediate Greek. (FL)** Review of grammar, reading of selected texts. Consent required. Taught at the Intercollegiate Center for Classical Studies in Rome. One course. *Staff*

**104A. Advanced Greek. (AL, FL)** Readings vary. Consent required. Taught at the Intercollegiate Center for Classical Studies in Rome. One course. *Staff*

**104S, 105S. Studies in Greek Literature. (AL, FL)** 104S: Herodotus and Sophocles. 105S: Thucydides and Aristophanes. One course each. *Staff*

**200. Readings in Greek Literature. (AL, FL)** One course. *Staff*

**201. Studies in Greek Literature I. (AL, FL)** One course. *Staff*

**203. Homer. (AL, FL)** Problems of language and structure in the *Iliad*; present state of Homeric scholarship. One course. *Burian or Stanley*

**205. Greek Lyric Poets. (AL, FL)** Fragments of the early lyric poets; selected odes of Pindar and Bacchylides. One course. *Burian or Stanley*

**207. The Dramatists. (AL, FL)** Readings and studies of selected plays by the major playwrights Aeschylus, Sophocles, Euripides, and Aristophanes. One course. *Burian*

**211. Greek Literature in the Roman Empire. (AL, FL)** Readings in the Second Sophistic, the novel, history, philosophy, and poetry. One course. *Rigsby*

**220. The Presocratic Philosophers. (CZ, FL)** C-L: Philosophy 220. One course. *Clay*

**222. The Historians. (AL, FL)** Readings and studies in the major Greek historians Herodotus, Thucydides, and Xenophon. One course. *Connor or Oates*

*Courses offered each year on demand in consultation with the director of undergraduate studies:*

**191, 192. Independent Study.** Directed reading and research. Open only to qualified juniors and seniors. Half or one course. Variable credit. *Staff*

**217T. Greek Prose Composition. (FL)** The course content is determined by the needs of the students enrolled. One course. *Staff*

### Courses Currently Unscheduled

**209. Introduction to Hellenistic Literature. (AL, FL)**

**210. Alexandrian Poetry. (AL, FL)**

**226. The Orators. (AL, FL)**

## LATIN (LAT)

**1-2. Elementary Latin. (FL)** Study of the structure of the language (forms, vocabulary, syntax, and pronunciation); selected readings in prose and poetry. Two courses. *Staff*

**14S. Intensive Elementary Latin. (FL)** Introduction to the grammar, offered only in the summer; combining the work of Latin 1 and 2 in one course. Two courses. *Staff*

**15S. Intensive Intermediate Latin. (FL)** Combining the work of Latin 63 and 64 in one course, offered only in the summer; selected readings in prose and poetry. Two courses. *Staff*

**63. Intermediate Latin: Prose. (FL)** Review of grammar and reading of selected prose, including Caesar. One course. *Staff*

**64. Intermediate Latin: Vergil. (FL)** Selected books of Vergil's *Aeneid*. One course. *Staff*

**64A. Intermediate Latin. (FL)** Review of grammar, reading of selected texts. Consent required. Taught at the Intercollegiate Center for Classical Studies in Rome. One course. *Staff*

**100. Introduction to Literature.** This number represents course credit for a score of 4 or 5 on one or more of the College Board Advanced Placement tests in Latin. One course.

**104A. Advanced Latin. (AL, FL)** Readings vary. Consent required. Taught at the Intercollegiate Center for Classical Studies in Rome. One course. *Staff*

**105S. Ovid: *The Metamorphoses*. (AL, FL)** The poem studied as representative of Ovid's varied narrative art, as the largest-scale Roman treatment of classical myths, and as Ovid's statement on Augustanism. One course. *Davis, Janan, or Newton*

**109S, 110S. Studies in Latin Literature. (AL, FL)** 109S: the Late Republic, including Catullus and Cicero. 110S: the Age of Augustus, including Horace and Livy. One course each. *Davis, Janan, or Stanley*

**111S. Elegiac Poets. (AL, FL)** The traditions of Latin love elegy and its development in Propertius, Tibullus, and Ovid. One course. *Davis or Janan*

**112S. Roman Comedy. (AL, FL)** Representative plays of Plautus and Terence with lectures on the genre and its Greek forebears. One course. *Richardson*

**116S. Lucretius. (AL, FL)** The *De Rerum Natura* studied as poetry and philosophical thought. One course. *Clay or Newton*

**200. Readings in Latin Literature. (AL, FL)** One course. *Staff*

**205. The Roman Novel. (AL, FL)** Readings in Petronius and Apuleius. One course. *Davis, Richardson, or Stanley*

**206S. Cicero. (AL, FL)** One course. *Richardson*

**207S. Vergil's *Aeneid*. (AL, FL)** Intensive analysis of all of Vergil's *Aeneid*, focusing on text and historical context, complemented by research papers and reports. Not open to students who have taken Latin 107S. One course. *Davis or Newton*

**208S. Lyric and Occasional Poetry. (AL, FL)** Readings in the works of Catullus, Horace, and Martial. Same as 108S, except additional term paper required. One course. *Davis, Janan, or Newton*

**221. Medieval Latin. (AL, FL)** Selected works of the Latin Middle Ages from Prudentius to the humanists. Genres studied usually include the hymn, sequence, drama, lyric, saints' lives, chronicle, epic, and epistle. C-L: Medieval and Renaissance Studies. One course. *Newton*



*Courses offered each year on demand in consultation with the director of undergraduate studies:*

**191, 192. Independent Study.** Directed reading and research. Open to qualified juniors and seniors. Half or one course. Variable credit. *Staff*

**217T. Latin Prose Composition. (FL)** The course content is determined by the needs of the students enrolled. One course. *Staff*

#### **Courses Currently Unscheduled**

**104. Advanced Latin. (AL, FL)**

**106S. Roman Satire. (AL, FL)**

**107S. Vergil's *Aeneid*. (AL, FL)**

**108S. Lyric and Occasional Poetry. (AL, FL)**

**170. Special Topics in Latin Literature. (AL, FL)**

**204. Epic of the Silver Age. (AL, FL)**

**211S. Elegiac Poets. (AL, FL)**

**214S. The Historians. (AL, FL)**

#### **CLASSICAL STUDIES (CS)**

**11S. Greek Civilization. (CZ)** The culture of the ancient Greeks from the Bronze Age to Alexander the Great: art, literature, history, philosophy, and religion. One course. *Staff*

**12S. Roman Civilization. (CZ)** The culture of the ancient Romans from their beginnings to Constantine: art, literature, history, philosophy, and religion. One course. *Staff*

**41S. The World of Aristophanes. (AL)** The comedies of Aristophanes as a window on fifth-century Athens: the conventions and public context of comedy, humor as an indicator of social values and limits, the literary consciousness of author and audience. Open only to students in the FOCUS Program. One course. *Burian*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**53. Greek History. (CZ)** The political and intellectual history of the Hellenes from earliest times to the death of Alexander the Great. C-L: History 53. One course. *Oates*

**54. Roman History. (CZ)** The Roman Republic and Empire to the Late Antique. C-L: History 54. One course. *Boatwright or Oates*

**70. The Age of Augustus. (CZ)** Augustus (63 B.C.-A.D. 14), the person, politician, and genius of a new age. His impact on contemporary historical, biographical, and literary writings, and on the architecture of his new empire, its coinage, and his own portraiture. C-L: History 94. One course. *Staff*

**99. Perspectives in Archaeology. (CZ)** Not open to students who have taken Religion 99. See C-L: Religion 177; also C-L: Judaic Studies. One course. *C. Meyers, E. Meyers, Younger, and staff*

**100. History of Ancient Philosophy. (CZ)** Not open to students who have taken Classical Studies 93 or Philosophy 93. See C-L: Philosophy 100. One course. *Ferejohn, Joy, or Mahoney*

**101. Science and Technology in the Ancient World. (CZ)** Technical innovation and scientific thought in the ancient Near East, Greece, and Rome. C-L: History 178A. One course. *Rigsby*

**102. History of Greek and Roman Civil Law. (CZ)** The development of law from the early Greek *polis* and Rome of the XII Tables to the *Digest* of Justinian, emphasizing civil law and procedure. C-L: History 182C. One course. *Oates*

**104S. Women in the Ancient World. (CZ)** The perception and reality of the roles, functions, and status of women from the time of Homer to late antiquity. C-L: History 126S and Women's Studies. One course. *Boatwright*

**105. Ancient and Medieval Epic. (AL)** Reading in translation of major epics from antiquity (*Gilgamesh*, Homer's *Iliad* and *Odyssey*, Vergil's *Aeneid*) and the European Middle Ages (*Beowulf*, *Song of Roland*, Dante's *Inferno*), with emphasis on definition and critique of changing conceptions of the hero. One course. *Burian or Davis*

**106. Drama of Greece and Rome. (AL)** Reading in translation of selected tragedies (Aeschylus, Sophocles, Euripides, Seneca) and comedies (Aristophanes, Menander, Plautus, Terence) with emphasis on contemporary theatrical practice, political, social, and cultural developments, and influence on later European drama. C-L: Drama 170. One course. *Burian or Clay*

**107. The Ancient Family: Comparative Histories. (CZ)** Definitions of the family throughout the ancient Mediterranean (Egypt, Palestine, Anatolia, Greece, and Italy). Roles of women, men, children and slaves; use of household space; marriage and sexuality, death and inheritance; comparisons with modern definitions of the family. One course. *Uzzi*

**115. The Classical Tradition. (AL)** The notion of the "classical" from the creation of the archetype to the present. One course. *Burian*

**116S. The Pagan World of the Divine Comedy. (AL)** See C-L: Distinguished Professor Courses 190S; also C-L: Medieval and Renaissance Studies. One course. *Clay*

**117. Ancient Myth in Literature. (AL)** Myth in classical and medieval writers from Hesiod to Boccaccio. C-L: Medieval and Renaissance Studies. One course. *Davis or Newton*

**118. Egyptian Art and Archaeology. (AL)** See C-L: Art History 120; also C-L: African and African-American Studies 120. One course. *Staff*

**120. Principles of Archaeology. (CZ)** Introduction to the many disciplines of archaeology, using a survey of cultures and civilizations to explain archaeological techniques, methods, theory, results, and ethics. One course. *Younger*

**123. Greek Art and Archaeology I: Geometric to Classical. (AL)** Architecture, sculpture, and painting from the geometric period (tenth century B.C.E.) to the classical (fourth century B.C.E.). C-L: Art History 123. One course. *Younger*

**124. Greek Art and Archaeology II: Classical to Greco-Roman. (AL)** Architecture, sculpture, painting, and mosaics from the classical period (fourth century B.C.E.) to the Greco-Roman (first century C.E.). C-L: Art History 124. One course. *Younger*

**128. Art of the Roman Empire. (AL)** See C-L: Art History 128. One course. *Cormack*

**130. Late Antique Christian Art. (AL)** See C-L: Art History 130; also C-L: Religion 130. One course. *Wharton*

**139. Aspects of Medieval Culture. (CZ)** See C-L: Medieval and Renaissance Studies 114; also C-L: Art History 139, and History 116. One course. *Rasmussen, Solterer, or Witt*

**144. Roman Architecture. (AL)** See C-L: Art History 126B. One course. *Cormack*

**145. Rome: History of the City.** (AL, CZ) The development of the urban plan and its major monuments through the ages; the influence of the ancient Republic and Empire, the Papacy, and the modern secular state; change and continuity in artistic forms and daily life. (Taught on site in Italy in summer.) C-L: Art History 126A. One course. *Staff*

**147. Ancient Greece.** (CZ) On-site study of the cultures in Greece from Neolithic to Medieval, concentrating on Athens, the Peloponnese, Crete, and the Cyclades. Summer program in Greece. Prerequisite: Classical Studies 11S, 53, 123, or 124, or History 53, or consent of instructor. C-L: Art History 115. One course. *Younger*

**148. The Ancient City.** Examination of the archaeological monuments of Rome and other Italian sites, as well as literary sources, inscriptions, and works of art. Consent required. Taught in Rome as part of the Intercollegiate Center for Classical Studies program. Students must register for both 148A and 148B.

**148A. Art and Archaeology.** (AL) One course. *Staff*

**148B. Political, Social, and Cultural Context.** (CZ) One course. *Staff*

**149. Venetian Civilization and Its Mediterranean Background.** (AL, CZ) Formation and development against the background of earlier, dominant Mediterranean cultures. (Taught in Venice.) One course. *Davis*

**155. The Aegean Bronze Age.** (CZ) Application of archaeological techniques and procedures to problems in the development of the Minoan and Mycenaean civilizations. C-L: Art History 114. One course. *Younger*

**157S. The Individual and Society: The Classical View.** (CZ) See C-L: Political Science 150S. One course. *Grant*

**162. Pompeii.** (CZ) Contributions of the city to knowledge of ancient Roman life: its history, houses and temples, amusements, and municipal administration. C-L: Art History 117. One course. *Richardson*

**174S. Culture Heroes Across Cultures.** (AL) See C-L: Distinguished Professor Courses 180S; also C-L: African and African-American Studies 172S. One course. *Davis*

**180. Special Topics in Classical Studies.** Topics to be announced. One course. *Staff*

**183. Etruscan Art and Architecture.** (AL) See C-L: Art History 183. One course. *Cormack*

**195S, 196S. Junior-Senior Seminars in Classical Studies.** (CZ) Specific aspects of the history, art, and literature of classical Greece and Rome. Open only to qualified juniors and seniors; some knowledge of classical studies and history desirable, but not strictly necessary. One course each. *Staff*

**203. Ancient Political Philosophy.** (SS) See C-L: Political Science 223. One course. *Gillespie or Grant*

**211S. Plato.** (CZ) Selected dialogues. C-L: Philosophy 211S. One course. *Ferejohn*

**217S. Aristotle.** (CZ) Selected topics. C-L: Philosophy 217S. One course. *Ferejohn*

**220S. Topics in Greek Art.** (AL) Consent of instructor required. See C-L: Art History 201S. One course. *Cormack*

**222. Fifth and Fourth Century Greece.** (CZ) From the Persian Wars to the dominance of Philip of Macedon. C-L: History 260. One course. *Oates or Rigshy*

**223. The Hellenistic World. (CZ)** The Hellenistic kingdoms in the Eastern Mediterranean and the rise of Roman power. C-L: History 261. One course. *Oates*

**224. The Roman Republic. (CZ)** The rise of Rome, to its mastery of the Mediterranean; the political, social, and intellectual consequences. C-L: History 263. One course. *Boatwright or Rigsby*

**225. The Roman Empire. (CZ)** The foundation, consolidation, and transformation of Roman rule from Augustus to Diocletian. C-L: History 264. One course. *Boatwright*

**227S. Topics in Roman Art. (AL)** Consent of instructor required. See C-L: Art History 202S. One course. *Cormack*

**231S. Greek Sculpture. (AL)** Free standing, relief, and architectural sculpture from the archaic period to the Hellenistic age, representing changing aesthetic, social, and political aims. C-L: Art History 238S. One course. *Younger*

**232S. Greek Painting. (AL)** From the Late Bronze Age to the fourth century B.C., with emphasis on archaic and classical Athenian vase painters. C-L: Art History 237S. One course. *Stanley*

**233S. Greek Architecture. (AL)** Development of form and function in the various religious, civic, and domestic building types, from the Bronze Age through the Hellenistic period. C-L: Art History 205S. One course. *Richardson or Younger*

**236S. Roman Painting. (AL)** The techniques, iconography, and use in decoration. C-L: Art History 227S. One course. *Richardson*

**260. The Byzantine Empire. (CZ)** One course. *Rigsby*

*Courses offered each year on demand in consultation with the director of undergraduate studies:*

**191, 192. Independent Study.** Directed reading and research. Open only to qualified juniors and seniors. One course each. *Staff*

**193, 194. Honors Research in Classical Studies.** Research culminating in the writing of one longer or two shorter papers as partial fulfillment of the requirements for graduation with distinction. Open only to senior majors. One course each. *Staff*

### **Courses Currently Unscheduled**

**103. Religion in Greece and Rome. (CZ)**

**113. Aristotle. (CZ)**

**129. The Age of Justinian. (AL)**

**131. Art of the Early Middle Ages. (AL)**

**135. Alexander the Great. (CZ)**

**137. Roman and Non-Roman in Ancient Italy. (CZ)**

**161S. Athens. (CZ)**

**171. Ancient Cosmology. (CZ)**

**221. Archaic Greece. (CZ)**

**226. Late Antiquity. (CZ)**

**230S. Topics in Early Christian and Byzantine Art. (AL)**

**235S. Roman Architecture. (AL)**

**258. The Hellenistic and Roman East. (CZ)**



## THE MAJOR

Students may major in classical languages and classical studies. Those contemplating graduate study in classics or related disciplines should consider completion of three college years of one ancient language and two years of the other, or equivalents, as a minimum. They are also reminded that reading knowledge of German and French is a requirement for advanced degrees in this field.

Majors are eligible for nomination to one semester of study, typically during the junior year, at the Intercollegiate Center for Classical Studies in Rome, which Duke manages, or at the College Year in Athens. Courses in Greek, Latin, ancient history, and archaeology taken at these institutions are counted toward major requirements. The cost of a semester at either institution is comparable to that of Duke. Financial assistance usually can be transferred, and arrangements are made through the university. For students not able to spend a semester abroad, Duke regularly offers summer programs in Greece and Italy. The department also facilitates participation in archaeological digs in Greece and Italy. For further information on opportunities for study abroad, see the section on Off Campus Opportunities in this bulletin.

### Classical Studies (Ancient History, Civilization, Literature, Archaeology)

*Prerequisites.* Classical Studies 11S or 53 and 12S or 54.

*Major Requirements.* Eight classical studies courses at or above the 100 level, including the capstone course—Classical Studies 195S or 196S. Courses must be in at least three separate areas (literature, in translation or in the original language at or above the 100 level; history; philosophy; art and archaeology). For double majors in classical studies and classical languages, no more than two courses in Greek and/or Latin may be counted toward both majors.

### Classical Languages (Greek and Latin)

*Major Requirements.* Minimum of ten courses, of which eight must be at the 100-level or above. Knowledge of both Greek and Latin through the second-year level (Greek 64 and Latin 64 or the equivalent) with a total of at least eight courses in Greek and/or Latin, of which six will be at or above the 100-level; two courses in classical studies at or above the 100-level, one of which will be the capstone course (Classical Studies 195S or 196S). For double majors in classical languages and classical studies, no more than two courses in Greek and / or Latin may be counted toward both majors.

### Graduation with Distinction

The department offers work leading toward graduation with distinction. See the section on honors in this bulletin and the departmental director of undergraduate studies.

## THE MINOR

Four minors are offered by the department, as listed below. No courses used to fulfill the requirements of one minor may be used for another, or for the majors in classical languages or classical studies.

### Classical Archaeology

*Requirements.* Five courses in ancient art and archaeology, at least three at the 100 level or above, and at least three in the Classical Studies Department.

### Classical Civilization

*Requirements.* Five courses in the Classical Studies Department, at least three at the 100 level or above; the courses must be in at least two areas (literature in the original language at the 100 level or above in translation; history; philosophy; art and archaeology).

## Greek

*Requirements.* Five courses in ancient Greek, at least three at the 100 level or above.

## Latin

*Requirements.* Five courses in Latin, at least three at the 100 level or above.

# Comparative Area Studies (CST)

Associate Research Professor Lewis and Professor Wigen, *Co-Directors*

A major or minor is available in this program.

The undergraduate major in comparative area studies offers a Bachelor of Arts degree to students interested in the interdisciplinary study of societies and cultures of two particular regions of the world. Students complement their primary concentration with work in a second world area and the comparative study of international themes or problems. The major allows a student to combine language study with courses in a variety of disciplines. As in area studies programs elsewhere, the result is a sustained focus on a single world area tailored to fit the student's interest.

Comparative area studies at Duke, however, is distinct from other area studies programs in several respects. The primary concentration encourages study in the social sciences and humanities as well as analysis of their social, historical, economic, and political roots and problems. The secondary concentration imparts breadth of focus and a cross-regional perspective to the course of study, while the required course on comparative methods ensures an analytic perspective that is multidisciplinary as well as global.

Students in the program are currently studying Latin America, North America, Africa, the Middle East, Russia, South Asia, East Asia, and Eastern and Western Europe. Many comparative area studies majors double-major in comparative area studies and in such fields as art history, cultural anthropology, history, political science, Spanish, and French. The program is unique in that it conjoins the social sciences and humanities. It is specifically designed for those with career objectives in academia, government (especially the Foreign Service), international business, international law, health and environmental programs, the United Nations and international agencies, and private international religious or service organizations.

The major draws its offerings from courses taught by over 130 Duke professors in fourteen cooperating departments. Interdisciplinary and intercultural courses have been designed specifically for majors in the program to help place those societies chosen for specialization in a broad comparative and global perspective. These courses stress the interrelationship of developed and underdeveloped societies and probe the difficulties and advantages of comparative, interdisciplinary, and intercultural research. The program is administered by its director and advisory committee representing the various areas and cooperating departments.

*Advising.* Students must identify the area of their primary concentration. Faculty members with expertise in each area are available to provide advice concerning selection of an area and appropriate coursework in the major. Selection of area is normally done by the end of the sophomore year. The program tries to foster close relationships between faculty and students working in similar areas.

*Study Abroad or on Another Campus.* The program encourages qualified and interested students to engage in sustained study abroad in their chosen area for a semester or for an academic year. Up to three courses taken in a non-Duke semester abroad program may be counted toward the requirements in the major. Duke students are eligible for a variety of programs now operating in Africa, Asia, Canada, Latin America, Russia, and Eastern and Western Europe. Students can also take advantage of internship programs with international agencies. Occasionally summer internships become available for qualified students.

*Grants and Awards.* Comparative Area Studies runs a program of grants and awards for majors. A competition is held in the fall to select a small group of upperclass majors to organize a symposium on a comparative/global issue during the spring semester. Summer stipends for travel and research abroad are also offered to selected rising senior majors planning to enroll in the honors seminar. The author of the best research paper submitted to the honors seminar is recognized by an award for excellence in comparative analysis.

The courses listed on the following pages meet requirements for the major as introductory courses, area courses, and comparative/global issue courses. Basic language courses and courses at the 100 and 200 level taught in the foreign language satisfy the foreign language corequisite; such courses are not listed. Only advanced language and literature courses meeting requirements for specific areas of the major are listed below. Selected non-listed upper level and seminar courses offered by various departments and programs (including Comparative Area Studies 140 and Comparative Area Studies 200S), the topics of which vary from semester to semester, may also be included if the topics covered fall within a particular area or focus on comparative/global issues. To determine if specific courses meet requirements for the major, consult the director. To meet the general studies requirement of Program I, courses in the major from only two areas of knowledge may be counted. For a complete description of each course, including cross-listings, consult the listing in the Duke University bulletin under the appropriate department or program.

## COMPARATIVE AREA STUDIES COURSES

**109. Contemporary Global Issues. (SS)** Nature of important global phenomena and conditions and their manifestations in diverse regions and societies. Includes such questions as what is progress? Are nation-states obsolete? How are we managing an interdependent world economy and a fragile global environment? C-L: Cultural Anthropology 109, History 109, Political Science 160, and Sociology 175. One course. *Staff*

**110. Global Human Geography. (CZ, SS)** World development and modernization through the lenses of geography. Patterns of adaptation by peoples and societies to different physical environments and the changing world economy. One course. *Lewis*

**125. Comparative Approaches to Global Issues. (CZ, SS)** Comparative research and analysis in the social sciences and the humanities: strengths and weaknesses of cross-cultural comparison as developed by sociologists, historians, political scientists, anthropologists, and specialists in comparative literature and religion. Not open to students who have taken Religion 121. C-L: Cultural Anthropology 125, History 137, Perspectives on Marxism and Society, Political Science 125, Religion 183, and Sociology 125. One course. *Staff*

**140. Selected Topics in Comparative Area Studies.** Topics vary from semester to semester, focusing either on specific world regions or particular comparative/global issues. One course. *Staff*

**150S. Comparative Area Studies Honors Seminar. (CZ)** Open to seniors majoring in Comparative Area Studies. Consent of instructor required. One course. *Staff*

**191, 192. Independent Study.** Individual intensive research project resulting in substantive written work. Consent of instructor and director of undergraduate studies required. One course each. *Staff*

**200S. Advanced Topics in Comparative Area Studies.** Topics vary, focusing either on specific world regions or particular comparative/global issues. One course. *Staff*

## INTRODUCTORY COURSES

### African and African-American Studies

70, 71. The Third World and the West. (Cross-listed.) *Staff*

### Cultural Anthropology

94. Introduction to Cultural Anthropology. *Staff*

### History

25. Introduction to World History: To 1700. *Staff*

26. Introduction to World History: Since 1700. *Staff*

75, 76. The Third World and the West. (Cross-listed.) *Staff*

### Literature

98. Introduction to the Study of Literature and Society. (Cross-listed.) *Lentricchia or Willis*

### Music

136. Music of the World's Peoples. *Meintjes*

### Political Science

92. Comparative Politics (B). *Staff*

### Religion

45. Religions of Asia. *Cornell, Lawrence, Nickerson, or staff*

## COMPARATIVE/GLOBAL ISSUES COURSES

### African and African-American Studies

121. Introduction to Asian and African Literature. (Cross-listed.) *Staff*

158A. New Perspectives on the Atlantic World. (Cross-listed.) *Ewald*

160. Women in Islam: Fact and Fiction. (Cross-listed.) *Cooke*

233S. Slave Resistance and Social Control in New World Societies. (Cross-listed.) *Gaspar*

### Art History

168. Art since 1945: Modernism and Postmodernism. (Cross-listed.) *Stiles*

169. Documentary Photography and Social Activism in the Nuclear Age. (Cross-listed.) *Stiles*

179. The History of Performance Art. (Cross-listed.) *Stiles*

### Asian and African Languages and Literature

121. Introduction to Asian and African Literature. (Cross-listed.) *Staff*

190. Women in Islam: Fact and Fiction. (Cross-listed.) *Cooke*

### Cultural Anthropology

108. Fantasy, Mass Media, and Popular Culture. *Allison*

110. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*

114. Languages of the World. (Cross-listed.) *Andrews or Tetel*

117. Global Culture. (Cross-listed.) *Piot*

119. Language, Culture, and Society. (Cross-listed.) *Apte, O'Barr, or Strauss*

126. Muslim World: Transformations and Continuities. (Cross-listed.) *Ewing*

137. Gender Inequality. (Cross-listed.) *Allison, Luttrell, Quinn, or Silverblatt*

142. Sexuality in Global Perspective. (Cross-listed.) *Luttrell*

189S. Crossing Cultures. *Staff*

190. Theoretical Foundations of Cultural Anthropology. *Staff*

191A, S. Feminist Ethnography. (Cross-listed.) *Luttrell*

### Drama

179. The History of Performance Art. (Cross-listed.) *Stiles*

### Economics

140. Comparative Economic Systems. *Trembl*

219S. Economic Problems of Underdeveloped Areas. *Kelley or Wallace*

240. Comparative Economic Systems. *Trembl*

286S. Economic Policy-Making in Developing Countries. (Cross-listed.) *Conrad or Ramachandran*

### English

114. Languages of the World. (Cross-listed.) *Andrews or Tetel*

120. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*

### History

101C. Terrorism, 1848-1968. *M. Miller*

112A, 112B. The World in the Twentieth Century. *Cell*



- 120. History of Socialism and Communism. *Lerner*
- 123S. Madness and Society in Historical Perspective. *M. Müller*
- 132. Modern World Environmental History, 1500 to the Present. *Richards*
- 158A. New Perspectives on the Atlantic World. (Cross-listed.) *Ewald*
- 207A, S. Geographic Perspectives in History I: Atlantic Worlds. *Wigen*
- 207B, S. Geographic Perspectives in History II: Asian and Pacific Worlds. *Wigen*
- 208A, S. Decentering the Cultural Map: Boundary Zones as Counter-Cores. *Lewis and Wigen*
- 225S. Problems in Comparative Labor History. (Cross-listed.) *Frendt or Keyssar*
- 233S. Slave Resistance and Social Control in New World Societies. (Cross-listed.) *Gaspar*
- 239. History of Socialism and Communism. *Lerner*

#### Linguistics

- 102. Languages of the World. (Cross-listed.) *Andrews or Tetel*

#### Literature

- 141. International Popular Culture. (Cross-listed.) *C. Davidson, Gaines, Radway, or Willis*

#### Political Science

- 107. Environmental Politics and Policies in the Industrial World (B). (Cross-listed.) *McKean*
- 147. Environmental Politics and Policies in the Developing World (B). (Cross-listed.) *McKean or Miranda*
- 148D. Environmental Politics Beyond Borders (D). (Cross-listed.) *McKean*
- 155. The Politics and Economics of Developing Areas (B). *Staff*
- 173S. Political Economy of World Food Problems (B). *Johns*
- 176A. Perspectives on Food and Hunger (B). *Johns*
- 176B. Perspectives on Food and Hunger (B). *Johns*
- 180. Media in Comparative Perspective (B). (Cross-listed.) *Staff*
- 217. Comparative and Historical Methods (B). (Cross-listed.) *Gereffi, Lin, or Tiryakian*
- 231S. Crisis, Choice, and Change in Advanced Democratic States (B). *Kitschelt*
- 266. Comparative Social Policy (B). (Cross-listed.) *Staff*
- 277. Comparative Party Politics (B). (Cross-listed.) *Lange*
- 284S. Public Policy Process in Developing Countries (B). (Cross-listed.) *Ascher*

#### Public Policy Studies

- 107. Environmental Politics and Policies in the Industrial World. (Cross-listed.) *McKean*
- 143D. Environmental Politics Beyond Borders (B). (Cross-listed.) *McKean*
- 147. Environmental Politics and Policies in the Developing World. (Cross-listed.) *McKean or Miranda*
- 266. Comparative Social Policy. (Cross-listed.) *Staff*
- 284S. Public Policy Process in Developing Countries. (Cross-listed.) *Ascher*
- 286S. Economic Policy-Making in Developing Countries. (Cross-listed.) *Conrad or Ramachandran*

#### Religion

- 103. Islam in East and Southeast Asia. *Cornell*
- 112. Muslim Minorities in Society: From Asia to America. *Cornell and Lawrence*
- 119. Muslim World: Transformations and Continuities. (Cross-listed.) *Ewing*
- 139. Women in Islam: Fact and Fiction. (Cross-listed.) *Cooke*
- 150. Mysticism. *Staff*

#### Russian

- 155. Special Topics in Russian and American Culture. *Lahusen and Van Tuyl*

#### Sociology

- 118. Sex, Gender, and Society. (Cross-listed.) *Buchmann or O'Rand*
- 126. Third World Development. (Cross-listed.) *Buchmann or Gereffi*
- 142. Organizations and Global Competitiveness. (Cross-listed.) *Buchmann or Gereffi*
- 143. Management and Labor Relations. *Gereffi or Thornton*
- 145. Nation, Regions, and the Global Economy. *Buchmann, Gereffi, or Shanahan*
- 160. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*
- 170. Mass Media. (Cross-listed.) *Staff*
- 171. Comparative Health Care Systems. (Cross-listed.) *Staff*
- 182. Media in Comparative Perspective. (Cross-listed.) *Staff*
- 214. Comparative and Historical Methods. (Cross-listed.) *Gereffi, Lin, or Tiryakian*

#### COMPARATIVE/GLOBAL ISSUES SPECIAL TOPICS COURSES

##### Political Science

- 100K.01 Anglo-American Constitutionalism, Law, and Legal Institutions. *Staff*
- 100L.02. Law and Liability: Personal Injury in Britain and the United States. *Staff*
- 100L, S. Duke Summer Program: Oxford. *Staff*

## Sociology

110E. Comparative Sociology: Cross-Regional. *Gereffi*

222S. B. Proseminars in Comparative and Historical Sociology: Globalization and Comparative Development. *Buchmann, Gao, Gereffi, Lin, Simpson, or Tiryakian*

222S. D. Proseminars in Comparative and Historical Sociology: Culture, Values, and Ideas. *Buchmann, Gao, Gereffi, Lin, Simpson, or Tiryakian*

## AREA COURSES: AFRICA

### African and African-American Studies

115A. History of Africa: From Antiquity to Early Modern Times. (Cross-listed.) *El Hamel or Ewald*

115B. History of Africa: From Early Modern Times to Independence. (Cross-listed.) *El Hamel or Ewald*

122. Culture and Politics in Africa. (Cross-listed.) *Piot*

171. From Apartheid to Democracy in South Africa. (Cross-listed.) *Johns*

177. North African Literature in Translation. (Cross-listed.) *Chergui*

### Asian and African Languages and Literature

174. North African Literature in Translation. (Cross-listed.) *Chergui*

### Cultural Anthropology

122. Culture and Politics in Africa. (Cross-listed.) *Piot*

### History

115A. History of Africa: From Antiquity to Early Modern Times. (Cross-listed.) *El Hamel or Ewald*

115B. History of Africa: From Early Modern Times to Independence. (Cross-listed.) *El Hamel or Ewald*

### Political Science

171. From Apartheid to Democracy in South Africa (B). (Cross-listed.) *Johns*

## AFRICA SPECIAL TOPICS COURSES

### Sociology

110A. Comparative Sociology: Africa. *Staff*

## AREA COURSES: EAST ASIA

### Art History

164. Early Chinese Art. *Abe*

170. Chinese Buddhist Art. *Abe*

171. Chinese Painting. *Abe*

172. Topics in Asian Art. *Abe*

272S. Topics in Chinese Art. *Abe*

274S. Topics in Japanese Art. *Weisenfeld*

### Asian and African Languages and Literature

153. East Asian Cultural Studies. (Cross-listed.) *Staff*

162. Modern Japanese Literature and Culture. *Ching or Yoda*

163. Korean Literature in Translation. *Staff*

165S. Modern Arabic Literature in Translation. *Staff*

182S. The Forbidden Books: Issues of Censorship in China. *Wang*

253. East Asian Cultural Studies. (Cross-listed.) *Staff*

262. Modern Japanese Literature and Culture. (Cross-listed.) *Ching or Yoda*

### Chinese

183S. Topics in Modern Chinese. *Staff*

184S. Topics in Modern Chinese. *Staff*

### Cultural Anthropology

146. East Asian Cultural Studies. (Cross-listed.) *Staff*

163. Foundations of Chinese Civilization. *Staff*

254. East Asian Cultural Studies. (Cross-listed.) *Staff*

260. Modern Japanese Literature and Culture. (Cross-listed.) *Ching or Yoda*

### Economics

134. Japanese Economy and Its History. *Staff*

142S. Chinese Economy in Transition. (Cross-listed.) *Yang*

242S. Chinese Economy in Transition. (Cross-listed.) *Yang*

## **History**

- 101K. Topics in Chinese Civilization. *Dirlik*
- 101M. Asian-Pacific Region in Historical Perspective. *Dirlik*
- 142A. China: Roots of Revolution. (Cross-listed.) *Dirlik or Mazumdar*
- 142B. China since 1949: The People's Republic. (Cross-listed.) *Dirlik or Mazumdar*
- 143A. Ancient and Early Modern Japan. *Wigen*
- 143B. The Emergence of Modern Japan. *Wigen*

## **Japanese**

- 183S, 184S. Topics in Japanese. *Ching*

## **Korean**

- 183, 184. Topics in Korean. *Staff*

## **Political Science**

- 100V. Duke Summer Program: Korea-Taiwan II. (Cross-listed.)
- 111. Contemporary Japanese Politics (B). *McKean*
- 133. Japan in World Politics (D). *McKean*

## **Public Policy Studies**

- 100A. East Asian Political Economy: Institutions, Networks, and Politics. (Cross-listed.) *Staff*
- 142S. Chinese Economy in Transition. (Cross-listed.) *Yang*
- 242S. Chinese Economy in Transition. (Cross-listed.) *Yang*

## **Sociology**

- 188C. East Asian Political Economy: Institutions, Networks, and Politics. (Cross-listed.) *Staff*

## **EAST ASIA SPECIAL TOPICS COURSES**

### **Political Science**

- 100U. Duke Summer Program: Korea-Taiwan I. Comparative Analysis of Democratic Institutions in East Asia. *Staff*

### **Sociology**

- 110B. Comparative Sociology: Asia. *Staff*

## **AREA COURSES: EASTERN EUROPE**

### **History**

- 110. History of Eastern Europe in Modern Times. *Lerner*
- 120. History of Socialism and Communism. *Lerner*
- 239. History of Socialism and Communism. *Lerner*

### **Political Science**

- 105. The Politics of Democratization in Eastern Europe (B). *Kitschelt*

### **Russian**

- 163. Literature of Former Soviet Republics. *Staff*
- 201S. Topics in Comparative Slavic Linguistics. (Cross-listed.) *Andrews*

## **AREA COURSES: LATIN AMERICA**

### **African and African-American Studies**

- 123. Modernity, Ethnicity, and Colonization. (Cross-listed.) *Mignolo or staff*

### **Art History**

- 195. Pre-Columbian Art and Culture of Andean South America. (Cross-listed.) *Staff*
- 257S. Topics in Pre-Columbian Art and Culture. *Staff*

### **Cultural Anthropology**

- 130. Modernity, Ethnicity, and Colonization. (Cross-listed.) *Mignolo or staff*
- 140S. Cultural Diversity in the Andes. (Cross-listed.) *Staff*

### **History**

- 136A. Introduction to Contemporary Latin American Reality. (Cross-listed.) *James*
- 136B. Biography and Politics in Latin America. (Cross-listed.) *French*
- 136C. Nineteenth-Century Latin America: Building Postcolonial Nations. (Cross-listed.) *Staff*
- 174B. Modern Latin America. (Cross-listed.) *Staff*
- 230S. Populism in Latin America. (Cross-listed.) *James*

## Latin American Studies

198. Special Topics in Latin American Studies. (Cross-listed.) *Staff*

## Political Science

151. Introduction to Latin American Politics (B). (Cross-listed.) *Morgenstern*

253S. Comparative Government and the Study of Latin America (B). (Cross-listed.) *Morgenstern*

## Portuguese

111S. Research Seminar in Contemporary Lusophone Issues. (Cross-listed.) *Damasceno*

200S. Seminar in Portuguese Literature. *Damasceno*

## Romance Studies

124. Modernity, Ethnicity, and Colonization. (Cross-listed.) *Mignolo or staff*

## Spanish

115, 116. Introduction to Spanish-American Literature. (Cross-listed.) *Staff*

121. Latin-American Literature in Translation. (Cross-listed.) *Dorfman*

124. Special Topics in Latin American Studies. (Cross-listed.) *Staff*

140C, S. Cultural Diversity in the Andes. (Cross-listed.) *Staff*

143S. Literature of the Discovery and Conquest of America. (Cross-listed.) *Staff*

144S. Spanish-American Literature of Identity. (Cross-listed.) *Pérez-Firmat*

145S. Literature of the Hispanic Minorities of the United States. (Cross-listed.) *Pérez-Firmat*

146. The Spanish-American Novel. (Cross-listed.) *Moreiras or staff*

147S. Latin-American Women Writers. (Cross-listed.) *Staff*

175S. Hispanic Literature and Popular Culture. (Cross-listed.) *Sieburth*

210. History of the Spanish Language. (Cross-listed.) *Garci-Gómez*

245. Latin-American Poetry. (Cross-listed.) *Moreiras or staff*

## LATIN AMERICA SPECIAL TOPICS COURSES

### Sociology

110D. Comparative Sociology: Latin America. *Staff*

## AREA COURSES: MIDDLE EAST

### African and African-American Studies

151. Islamic Mysticism: Arabic (Western) Tradition. (Cross-listed.) *Cornell*

177. North African Literature in Translation. (Cross-listed.) *Chergui*

### Arabic

125, 126. Advanced Arabic. *Cooke*

183, 184. Topics in Arabic. *Cornell*

### Asian and African Languages and Literature

165S. Modern Arabic Literature in Translation. *Staff*

174. North African Literature in Translation. (Cross-listed.) *Chergui*

### Cultural Anthropology

126. Muslim World: Transformations and Continuities. (Cross-listed.) *Ewing*

147, 148. Introduction to Islamic Civilization. (Cross-listed.) *Cornell, Lawrence, and staff*

### History

101G, 102G. Introduction to Islamic Civilization. (Cross-listed.) *Cornell, Lawrence, and staff*

152. The Modern Middle East. (Cross-listed.) *Y. Miller*

296. United States Policy in the Middle East. (Cross-listed.) *Kuniholm*

### Public Policy Studies

257. United States Policy in the Middle East. (Cross-listed.) *Kuniholm*

### Religion

119. Muslim World: Transformations and Continuities. (Cross-listed.) *Ewing*

134. Jewish Mysticism. (Cross-listed.) *Bland*

136. Contemporary Jewish Thought. (Cross-listed.) *Bland or E. Meyers*

146, 147. Introduction to Islamic Civilization. (Cross-listed.) *Cornell, Lawrence, and staff*

152A. Islamic Mysticism: Arabic (Western) Tradition. (Cross-listed.) *Cornell*

284. The Religion and History of Islam. *Cornell or Lawrence*



## AREA COURSES: NORTH AMERICA

### African and African-American Studies

123. Modernity, Ethnicity, and Colonization. (Cross-listed.) *Mignolo or staff*  
124S. Slave Society in Colonial Anglo-America: The West Indies, South Carolina, and Virginia. (Cross-listed.) *Gaspar*  
233S. Slave Resistance and Social Control in New World Societies. (Cross-listed.) *Gaspar*

### Canadian Studies

98. Introduction to Canada. (Cross-listed.) *Staff*  
184S. Canadian Issues. (Cross-listed.) *Staff*  
185S. The Canadian Health Care System. (Cross-listed.) *Warren*  
282S. Canada. (Cross-listed.) *Staff*

### Cultural Anthropology

124. American Indian Peoples. *Staff*  
130. Modernity, Ethnicity, and Colonization. (Cross-listed.) *Mignolo or staff*  
184S. Canadian Issues. (Cross-listed.) *Staff*  
185S. The Canadian Health Care System. (Cross-listed.) *Warren*  
282S. Canada. (Cross-listed.) *Staff*

### Economics

98. Introduction to Canada. (Cross-listed.) *Staff*  
184S. Canadian Issues. (Cross-listed.) *Staff*  
185S. The Canadian Health Care System. (Cross-listed.) *Warren*  
282S. Canada. (Cross-listed.) *Staff*

### English

- 186A, S. Canadian Literature in English. (Cross-listed.) *A. Davidson*

### French

169. The Contemporary Novel in French Canada. (Cross-listed.) *Keineg*

### History

98. Introduction to Canada. (Cross-listed.) *Staff*  
108C. Canadian-American Relations. (Cross-listed.) *Thompson*  
108E, S. The Canadian Health Care System. (Cross-listed.) *Warren*  
119A, 119B. Native American History. (Cross-listed.) *Wood*  
121A. America in International Affairs, 1607-1861. *Staff*  
124S. Slave Society in Colonial Anglo-America: The West Indies, South Carolina, and Virginia. (Cross-listed.) *Gaspar*  
131B. The Spanish Caribbean. (Cross-listed.) *TePaske*  
145A, 145B. African-American History. (Cross-listed.) *Gavins*  
183S. Canada from the French Settlement. (Cross-listed.) *Thompson*  
184S. Canadian Issues. (Cross-listed.) *Staff*  
233S. Slave Resistance and Social Control in New World Societies. (Cross-listed.) *Gaspar*  
282S. Canada. (Cross-listed.) *Staff*

### Literature

163. The Canadian Image: Cultural Production in French and English Canada. (Cross-listed.) *A. Davidson*

### Political Science

98. Introduction to Canada. (Cross-listed.) *Staff*  
184S. Canadian Issues (B). (Cross-listed.) *Staff*  
185S. The Canadian Health Care System (B). (Cross-listed.) *Warren*  
203S. Issues in Politics and the Media in the United States (A). (Cross-listed.) *Paletz*  
266. Comparative Social Policy (B). (Cross-listed.) *Staff*  
277. Comparative Party Politics (B). (Cross-listed.) *Lange*  
282S. Canada (B). (Cross-listed.) *Staff*

### Public Policy Studies

- 187S. The Canadian Health Care System. (Cross-listed.) *Warren*  
266. Comparative Social Policy. (Cross-listed.) *Staff*

### Romance Studies

124. Modernity, Ethnicity, and Colonization. (Cross-listed.) *Mignolo or staff*

## Sociology

- 98. Introduction to Canada. (Cross-listed.) *Staff*
- 184S. Canadian Issues. (Cross-listed.) *Staff*
- 185S. The Canadian Health Care System. (Cross-listed.) *Warren*
- 282S. Canada. (Cross-listed.) *Staff*

## Spanish

- 115, 116. Introduction to Spanish-American Literature. (Cross-listed.) *Staff*
- 143S. Literature of the Discovery and Conquest of America. (Cross-listed.) *Staff*
- 145S. Literature of the Hispanic Minorities of the United States. (Cross-listed.) *Pérez-Firmat*
- 146. The Spanish-American Novel. (Cross-listed.) *Moreiras or staff*
- 245. Latin-American Poetry. (Cross-listed.) *Moreiras or staff*

## AREA COURSES: RUSSIA

### Drama

- 177S. Chekhov. (Cross-listed.) *Flath and staff*

### Economics

- 293S. Russian Economic History. *Trembl*
- 294S. Soviet Economy in Transition. *Trembl*

### History

- 120. History of Socialism and Communism. *Lerner*
- 146S. Introduction to Russian Civilization. (Cross-listed.) *Pelech*
- 161. History of Modern Russia. *M. Miller*
- 180. The Soviet Experience. *Lerner*
- 185A. Socialist Realism: Soviet Literature of the 1930s and 1940s. (Cross-listed.) *Lahusen*
- 201S. The Russian Intelligentsia and the Origins of the Revolution. *M. Miller*
- 202S. The Russian Revolution. *M. Miller*
- 239. History of Socialism and Communism. *Lerner*
- 262. The Soviet Experience. *Lerner*

### Political Science

- 165. Politics and Foreign Policy of Russia (B). *Hough*

### Russian

- 103S, 104S. Studies in the Russian Language and Culture. *Staff*
- 130. Soviet Cinema. (Cross-listed.) *Gaines, Jameson, and Lahusen*
- 131. Language, Culture, and Myth: The Slavic Proverb. *Staff*
- 135. Contemporary Russian Media. (Cross-listed.) *Andrews*
- 135A. Contemporary Russian Media. (Cross-listed.) *Staff*
- 149S. Russian Culture in the Era of Terror: A Reexamination. (Cross-listed.) *Lahusen*
- 155. Special Topics in Russian and American Culture. *Lahusen and Van Tuyl*
- 159. Women's Autobiographies in European Contexts: Telling the Self in Russia, France, and Britain. (Cross-listed.) *Gheith*
- 160. The Classics of Russian Twentieth-Century Literature. *Lahusen*
- 161. Masterpieces of Nineteenth-Century Russian Literature I. *Staff*
- 162. Masterpieces of Nineteenth-Century Russian Literature II. *Staff*
- 168S. Russian Classical Literature and Music. *Staff*
- 170. Russian Dissident and Emigré Literature. *Lahusen*
- 172S. Pushkin and His Time. *Gheith or Van Tuyl*
- 175. Tolstoy. *Van Tuyl*
- 176. Dostoevsky. (Cross-listed.) *Flath, Gheith, or Van Tuyl*
- 177S. Chekhov. (Cross-listed.) *Flath and staff*
- 178A. Russian Short Fiction. *Gheith*
- 178B. Russian Short Fiction in the Original. *Gheith*
- 181. The Soviet 1920s: The Road to a New Synthesis. (Cross-listed.) *Lahusen*
- 182. Socialist Realism: Soviet Literature of the 1930s and 1940s. (Cross-listed.) *Lahusen*
- 183. Post-Stalinist and Contemporary Soviet Literature. *Lahusen*
- 185S. Introduction to Slavic Linguistics. (Cross-listed.) *Andrews*
- 186S. History of the Russian Language. (Cross-listed.) *Andrews*
- 190S. Introduction to Russian Civilization. (Cross-listed.) *Pelech*
- 195. Advanced Russian. *Andrews or Maksimova*
- 196. Advanced Russian: Readings, Translation, and Syntax. *Andrews or Maksimova*
- 201S. Topics in Comparative Slavic Linguistics. (Cross-listed.) *Andrews*
- 261. Masterpieces of Nineteenth-Century Russian Literature I. *Staff*
- 262. Masterpieces of Nineteenth-Century Russian Literature II. *Staff*
- 269. Women and Russian Literature. (Cross-listed.) *Gheith*

## AREA COURSES: SOUTH ASIA

### Art History

217. Islam and Islamic Art in India. (Cross-listed.) *Lawrence*

### Asian and African Languages and Literature

137. Contemporary Culture in South Asia. *Khanna*

160, 161. Introduction to the Civilizations of Southern Asia. (Cross-listed.) *Khanna*

### Cultural Anthropology

101, 102. Introduction to the Civilizations of Southern Asia. (Cross-listed.) *Khanna*

120. South Asia: Institutions and Change. *Apte or Ewing*

147, 148. Introduction to Islamic Civilization. (Cross-listed.) *Cornell, Lawrence, and staff*

### History

101G, 102G. Introduction to Islamic Civilization. (Cross-listed.) *Cornell, Lawrence, and staff*

164. India, Pakistan, and Bangladesh: 1750 to the Present. *Richards*

193, 194. Introduction to the Civilizations of Southern Asia. (Cross-listed.) *Khanna*

248. History of Modern India and Pakistan, 1857 to the Present. *Richards*

### Religion

144, 145. Introduction to the Civilizations of Southern Asia. (Cross-listed.) *Khanna*

146, 147. Introduction to Islamic Civilization. (Cross-listed.) *Cornell, Lawrence, and staff*

152B. Islamic Mysticism: Perso-Indian (Eastern) Traditions. *Lawrence*

217. Islam and Islamic Art in India. (Cross-listed.) *Lawrence*

## AREA COURSES: WESTERN EUROPE

### Art History

152. Art of the Netherlands in the Sixteenth Century. (Cross-listed.) *Van Miegroet*

153. Art of the Northern Netherlands in the Seventeenth Century. (Cross-listed.) *Van Miegroet*

154. German Art in the Fifteenth and Sixteenth Centuries. (Cross-listed.) *Van Miegroet*

155. Mercantile Culture and Art in the Netherlands. (Cross-listed.) *De Marchi and Van Miegroet*

158-159. History of Netherlandish Art and Visual Culture in a European Context. *Van Miegroet*

161. Nineteenth-Century Art, 1789-1848: Revolution to Revolution. *Staff*

167. Twentieth-Century Art, 1900-1945: The Avant-garde and Modernism. (Cross-listed.) *Stiles*

187. Surrealism. (Cross-listed.) *Stiles*

### Cultural Anthropology

139. Marxism and Society. (Cross-listed.) *Staff*

182. Contemporary European Issues. (Cross-listed.) *Staff*

### Distinguished Professor Courses

192. French Existentialism: 1940-1960. *Mudimbe*

### Economics

60. Economics of a United Europe. *Tolksdorf*

146. Adam Smith and the System of Natural Liberty. *De Marchi*

148. History of Economic Thought. *De Marchi or Goodwin*

### Education

139. Marxism and Society. (Cross-listed.) *Staff*

### French

104S. French for Current Affairs. *Keineg or staff*

109S. French for Business. *Staff*

117S. Contemporary Ideas. *Staff*

137. Aspects of Contemporary French Culture. *Staff*

139. French Civilization. *Keineg or Tetel*

145S. Topics in Renaissance Literature and Culture. (Cross-listed.) *Tetel*

153. The French Enlightenment. *Stewart*

256. Modern Literature and History. (Cross-listed.) *Kaplan, Orr, or staff*

## German

- 100S. Business German. *Dowell*
- 152S. Berlin in Literature and Culture. *Wohlfeil*
- 153. Aspects of Contemporary German Culture. *Staff*
- 245S. The Twentieth Century. *Rolleston*
- 247S. Postwar German Literature. *Staff*
- 270. Consciousness and Modern Society. (Cross-listed.) *Rolleston*

## History

- 107A. Tudor/Stuart Britain. (Cross-listed.) *Herrup*
- 107B. Modern Britain. (Cross-listed.) *Thorne*
- 117. Early Modern Europe. (Cross-listed.) *Neuschel*
- 135B. Germany from 1871 to 1933. *Koonz*
- 135C. Germany from 1933 to 1990. *Koonz*
- 138. Renaissance and Reformation Germany. (Cross-listed.) *Robisheaux*
- 156A. The Reformation of the Sixteenth Century. (Cross-listed.) *Hillerbrand*
- 171A. History of Women in Early Modern Europe. (Cross-listed.) *Neuschel*
- 186. Marxism and Society. (Cross-listed.) *Staff*
- 214. Class, Public Opinion, and the French Revolution. *Reddy*
- 221. Special Topics in the History of Europe, 1200-1700. (Cross-listed.) *Neuschel or Robisheaux*
- 251B. Topics in Intellectual History of Europe, 1450-1650. (Cross-listed.) *Witt*
- 256. Modern Literature and History. (Cross-listed.) *Kaplan, Orr, or staff*
- 268S. England in the Seventeenth Century. (Cross-listed.) *Herrup*

## Italian

- 115. Italian Women Writers. (Cross-listed.) *Finucci*
- 118S. Italian Literature and Popular Culture. *Finucci or staff*
- 123. Aspects of Italian Literature. (Cross-listed.) *Finucci*
- 131. Topics in Italian Civilization. *Finucci or staff*
- 155S. Nineteenth-Century Italian Literature. *Caserta*
- 159S. Topics in Sexuality and Gender Studies. (Cross-listed.) *Finucci or staff*
- 170S. Film and the Italian Novel. (Cross-listed.) *Finucci*
- 283. Italian Novel of the Novecento. *Caserta*

## Literature

- 181. Marxism and Society. (Cross-listed.) *Staff*

## Music

- 119. The Humanities and Music. *Bartlet or staff*
- 143. Beethoven and His Time. *Bartlet, Gilliam, Silbiger, or Todd*
- 144. Bach and His Time. *Silbiger*
- 145. Mozart and His Time. *Silbiger*
- 158S. Music History III: After 1850. *Gilliam or Todd*
- 159S. Music History II: From 1650 to 1850. *Bartlet or Silbiger*

## Political Science

- 115. Politics and Society in Germany (B). *Kitschelt*
- 136. Comparative Government and Politics: Western Europe (B). *Kitschelt or Lange*
- 216S. Evolution of European Marxism (C-N). *Coles*
- 225. Topics in Comparative Government and Politics: Western Europe (B). *Kitschelt or Lange*
- 232. Political Economy: Theory and Applications (C-E). *Lange*

## Religion

- 158. The Reformation of the Sixteenth Century. (Cross-listed.) *Hillerbrand*

## Russian

- 159. Women's Autobiographies in European Contexts: Telling the Self in Russia, France, and Britain. (Cross-listed.) *Gheith*

## Sociology

- 138D. History of Social Thought. *Tiryakian or Wilson*
- 139. Marxism and Society. (Cross-listed.) *Staff*

## Spanish

- 133. Contemporary European Issues. (Cross-listed.) *Staff*
- 137. Topics in Contemporary Spanish Culture. *Garci-Gómez*
- 171. Literature of Contemporary Spain. (Cross-listed.) *Vilarós or staff*
- 210. History of the Spanish Language. (Cross-listed.) *Garci-Gómez*



## WESTERN EUROPE SPECIAL TOPICS COURSES

### History

100A. History of Modern Spain. *Staff*

100L. German History from 1870 to the Present. *Staff*

### Political Science

100A. Duke Semester/Academic Year Program: Berlin. *Staff*

100E. Duke Summer Program: London. *Staff*

100J. Duke Wind Symphony Semester Program: Vienna. *Staff*

### Sociology

110C. Comparative Sociology: Europe. *Staff*

## THE MAJOR

*Corequisite Foreign Language Requirement.* Four (4) semester courses in a single language of the primary area are required. Students with advanced placement credits or other evidence of foreign language proficiency are not exempted from this requirement. However, in the following cases students may substitute one or two nonlanguage courses to meet this requirement: (1) if a second year of a language is not taught at Duke, or (2) if no language course is available at a sufficiently advanced level. In these cases, approved humanities or social science courses taught in a foreign language, or a year of general linguistics or literature in translation, may be substituted for the second year of a language. The specific language courses are too numerous to list here. Area advisors should be consulted for specific approval of the language choice if it does not conform to the list below.

*Africa:* Swahili; Arabic; relevant European language, such as French or Portuguese, may be used if appropriate to specific programs.

*East Asia:* Chinese, Japanese, Korean.

*Eastern Europe:* Relevant Eastern Europe language, such as Polish or Estonian.

*Latin America:* Spanish; Portuguese for specialization in Brazil.

*East:* Arabic, Persian; modern Hebrew for specialization in Israel.

*North America:* French or Spanish.

*Russia:* Russian.

*South Asia:* Hindi-Urdu.

*Western Europe:* French, German, Italian, Portuguese, Spanish.

### *Major Requirements.*

1. **Introductory Courses:** Two (2) introductory courses emphasizing comparative approaches from two different departments. One of these courses must be Comparative Area Studies 110, Global Human Geography. See list above for other introductory courses.
2. **Primary Area Courses:** Four (4) semester courses in the geographical area of special interest (the area of the language studied), with strong commendation for multidisciplinary course selection. Areas and courses are listed above. Others may be selected with the consent of the director.
3. **Secondary Concentration:** The secondary concentration must be in another geographic area. Students must take two (2). Qualifying courses are listed above.
4. **Two (2) Comparative/Global Issues Courses.** To satisfy the comparative/global issue requirements of the major, each student must elect one comparative/global issue course and also take Comparative Area Studies 125, Comparative Approaches to Global Issues. Comparative Area Studies 125 will be coordinated by faculty members affiliated with comparative area studies, but will also include guest

lectures. The purpose of this course is to teach students the various strategies that can be employed in making appropriate comparisons within and across distinct regions of the world. The course will offer a lecture/discussion format, and students will be asked to write a series of brief papers that reflect the cross-cultural and interdisciplinary objectives of the major. Normally, students should take this course in their sophomore or junior year, not in their senior year.

*Graduation with Distinction.* For graduation with distinction, the student must complete a research project in the senior year, in the Comparative Area Studies 150S senior seminar. Candidates must apply in their junior year. Selection criteria will include both the feasibility of the proposed topic, and the student's ability and skills to carry it out successfully. Inquiries should be addressed to the Director, Comparative Area Studies, 107C West Duke Building.

## THE MINOR

*Corequisite.* Two courses in a foreign language appropriate to the primary geographic area.

*Requirements.* Five courses, at least three of which must be at the 100-level or above, and including Comparative Area Studies 110 (Global Human Geography), Comparative Area Studies 125 (Comparative Approaches to Global Issues), two courses in a primary geographic area, one course in a secondary geographic concentration.

## Computer Science (CPS)

Professor Vitter, *Chair*; Associate Professor of the Practice Ramm, *Director of Undergraduate Studies*; Associate Professor of the Practice Astrachan, *Director of Teaching and Learning*; Professors Agarwal, Behringer, Biermann, Gelenbe, Loveland, Marinos, Palmer, Reif, Rose, Trivedi, and Utku; Associate Professors Board, Ellis, Greenside, Kedem, and Wagner; Assistant Professors Chase, Lebeck, Littman, Prisant and Sun; Professors Emeriti Gallie, Patrick, and Starmer; Associate Professor of the Practice Rodger; Assistant Research Professor Arge; Adjunct Professors Coughran and Whitted; Adjunct Associate Professor Brglez; Adjunct Assistant Professors Markas and Narten; Lecturer Duvall

A major or a minor is available in this department.

The Department of Computer Science provides courses on the concepts of computing and computers, their capabilities, and uses. In most courses students make extensive use of the available computing facilities. Students who wish to take a single introductory course, as part of their general education, usually elect either Computer Science 1 or 6.

In cooperation with the Microelectronics Center of North Carolina (MCNC), the University of North Carolina at Chapel Hill, and other MCNC-affiliated universities in North Carolina, the department often sponsors advanced computer science and other high technology courses originating at other universities. These are available through a closed circuit television and data network belonging to MCNC. Contact the Department of Computer Science for further information on the availability of such courses.

**1. Computer Science Fundamentals. (QR)** An overview for students not intending to major in computer science. Computer programming, symbolic and numeric computation, electric circuits, architectures, translation, time complexity, noncomputability, and artificial intelligence. Not open to students having credit for Computer Science 6 or higher. One course. *Biermann and staff*

**4. Introduction to Programming. (QR)** A study of clear thinking and problem solving using the computer. Representation, problem decomposition, and structured or object oriented programming. Students learn a modern computer language and develop skills by solving a variety of symbolic and numerical problems. Not intended as an introduction to the major. One course. *Staff*

**6. Introduction to Program Design and Analysis I. (QR)** Problem-solving techniques using a computer, top-down decomposition and object-oriented solution methodologies, introduction to programming, programming in the C/C++ language, introduction to UNIX and programming environments, recursion, analysis of execution times, linked data structures, searching, and sorting. Normally the first course for majors in computer science who have no programming experience. One course. *Astrachan, Ramm, or Rodger*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**100. Program Design and Analysis II. (QR)** A continuation of Computer Science 6. Overview of advanced data structures and analysis of algorithms, data abstraction and abstract data types, object-oriented programming, proofs of correctness, complexity, and computability. Prerequisite: Computer Science 6. One course. *Astrachan or Rodger*

**100E. Program Design and Analysis II. (QR)** Same as Computer Science 100, except designed for students with considerable programming background who have not taken Computer Science 6. Overview of advanced data structures and analysis of algorithms, data abstraction and abstract data types, object-oriented programming, proofs of correctness, complexity, and computability. One course. *Staff*

**104. Computer Organization and Programming. (QR)** Computer structure, machine language, instruction execution, addressing techniques, and digital representation of data. Computer systems organization, logic design, microprogramming, and interpreters. Symbolic coding and assembly systems. Prerequisite: Computer Science 100 or consent of instructor. One course. *Ramm and staff*

**106. Programming Languages. (QR)** Syntax and semantics of programming languages. Compilation, interpretation, and programming environments; including programming languages such as Algol, PL/1, Pascal, APL, LISP, and Prolog. Exercises in programming. Prerequisite: Computer Science 104. One course. *Staff*

**108. Software Design and Implementation. (QR)** Techniques for design and construction of reliable, maintainable and useful software systems. Programming paradigms and tools for medium to large projects: revision control, UNIX tools, performance analysis, GUI, software engineering, testing, documentation. Prerequisite: Computer Science 100. One course. *Astrachan*

**109. Program Design and Construction. (QR)** Substantial programs. Design specifications, choice of data structures, estimation of programming effort, stepwise development, and program-testing methodology. Programming teams and human factors in system implementation. Advanced topics in use of a procedural language and file management. Prerequisite: Computer Science 104. One course. *Staff*

**110. Introduction to Operating Systems. (QR)** Basic concepts and principles of multiprogrammed operating systems. Processes, interprocess communication, CPU scheduling, mutual exclusion, deadlocks, memory management, I/O devices, file systems, protection mechanisms. Prerequisites: Computer Science 100 and 104. One course. *Staff*

**120L. Introduction to Switching Theory and Logic Design. (QR)** See C-L: Electrical Engineering 151L. One course. *Marinos or Strole*

**130. Introduction to the Design and Analysis of Algorithms. (QR)** Design and analysis of efficient algorithms including sorting, searching, dynamic programming, graph algorithms, fast multiplication, and others; nondeterministic algorithms and computationally hard problems. Prerequisites: Computer Science 100 or equivalent and three semesters of college mathematics. One course. *Staff*



**140. Mathematical Foundations of Computer Science. (QR)** An introduction to theoretical computer science including studies of abstract machines, the language hierarchy from regular sets to recursively enumerable sets, noncomputability, and complexity theory. Prerequisites: Computer Science 100 and Mathematics 103. One course. *Loveland or Rodger*

**148. Logic and Its Applications. (QR)** Prerequisite: a course in logic or consent of instructor. See C-L: Mathematics 188; also C-L: Philosophy 150. One course. *Staff*

**149S. Problem Solving Seminar. (QR)** Techniques for attacking, solving, and writing computer programs for challenging computational problems. Algorithmic and programming language tool kits. Course may be repeated. Consent of instructor required. Half course. *Staff*

**150. Introduction to Numerical Methods and Analysis. (QR)** Theory, algorithms, and software that concern numerical solution of linear equations, approximation and interpolation of functions, numerical solution of nonlinear equations, and numerical solution of ordinary differential equations. Prerequisite: Computer Science 6; Mathematics 31; 32; 104 or 111. One course. *Staff*

**170. Methodologies in Artificial Intelligence. (QR)** Theories of representation and search in artificial intelligence. Logic, semantic networks, production rules, frames, distributed models, and procedural representations; algorithmic and heuristic search. One course. *Biermann or Loveland*

**191, 192. Independent Study.** Directed reading and research for qualified juniors. Consent of instructor and director of undergraduate studies required. One course each. *Staff*

**193, 194. Independent Study.** Directed reading and research for qualified seniors. Consent of instructor and director of undergraduate studies required. One course each. *Staff*

**195. Computer Science Internship.** Open to computer science majors engaged in industrial work experience only. A faculty member will supervise a program of study related to the work experience, including a substantive paper containing significant analysis and interpretation on a computer science-related topic. Consent of director of internship programs required. Prerequisites: Computer Science 104 and 108. One course. *Staff*

**196. Topics in Computer Science. (QR)** Topics from various areas of computer science, changing each year. Prerequisite: Computer Science 100 or equivalent. One course. *Staff*

#### **For Seniors and Graduates**

**206. Programming Languages. (QR)** Information binding, data structures and storage, control structures, recursion, execution environments, input/output; syntax and semantics of languages; study of PL/1, Fortran, Algol, APL, LISP, SNOBOL, and SIMULA; exercises in programming. Prerequisite: Computer Science 100. One course. *Wagner*

**208. Programming Methodology. (QR)** Practical and theoretical topics including structured programming, specification and documentation of programs, debugging and testing strategies, choice and effective use of programming languages and systems, psychology of computer programming, proof of correctness of programs, analysis of algorithms, and properties of program schemata. Prerequisite: Computer Science 100. One course. *Staff*

**210. Operating Systems. (QR)** Fundamental principles of operating system design applied to state-of-the-art computing environments (multiprocessors and distributed systems) including process management (coscheduling and load balancing), shared memory management (data migration and consistency), and distributed file systems. One course. *Chase or Ellis*



**212. Distributed Information Systems. (QR)** Principles and techniques for sharing information reliably and efficiently in computer networks, ranging from high-speed clusters to global-scale networks (for example, the Internet). Topics include advanced distributed file systems, distributed programming environments, replication, caching and consistency, transactional concurrency control, reliable update and recovery, and issues of scale and security for Internet information services. Prerequisites: Computer Science 210, or Computer Science 110 and 214, or consent of instructor. One course. *Chase*

**214. Computer Networks and Distributed Systems. (QR)** Basic systems support for process-to-process communications across a computer network. The TCP/IP protocol suite and the Berkeley sockets application programs interface. Development of network application programs based on the client-server model. Remote procedure call and implementation of remote procedure call. Prerequisite: knowledge of the C programming language. One course. *Staff*

**216. Data Base Methodology. (QR)** Basic concepts and principles. Relational, hierarchical, and network approaches to data organization; data entry and query language support for data base systems; theories of data organization; security and privacy issues. Not open to students who have taken Computer Science 241. Prerequisites: Computer Science 104 and either 109 or equivalent. One course. *Staff*

**218. Compiler Construction. (QR)** Models and techniques used in the design and implementation of assemblers, interpreters, and compilers. Lexical analysis, compilation of arithmetic expressions and simple statements, specifications of syntax, algorithms for syntactic analysis, code generation and optimization techniques. One course. *Wagner*

**220. Advanced Computer Architecture I. (QR)** Fundamental aspects of advanced computer architecture design and analysis, with consideration of interaction with compilers, operating systems, and application programs. Topics include processor design, pipelining, caches (memory hierarchies), virtual memory, and advanced storage systems, and simulation techniques. Advanced topics include a survey of parallel architectures and future directions in computer architecture. Prerequisite: Computer Science 104 or equivalent. One course. *Kedem, Lebeck, or Wagner*

**221. Advanced Computer Architecture II. (QR)** Fundamental aspects of parallel computer architecture design and analysis, including hardware/software tradeoffs, interactions with compilers, operating systems, run-time libraries, and parallel applications. Topics include parallel programming, message passing, shared memory, cache coherence, cache consistency, bus-based shared memory, distributed shared memory, interconnection networks, synchronization, on-chip parallelism. Prerequisite: Computer Science 220 or equivalent. One course. *Lebeck*

**222. Introduction to VLSI Systems.** A first course in VLSI design with CMOS technologies. A study of devices, circuits, fabrication technology, logic design techniques, subsystem design and system architecture. Modeling of circuits and subsystems. Testing of gates, subsystems and chips, and design for testability. The fundamentals of full-custom design, and some semi-custom design. Prerequisite: Electrical Engineering 151 or equivalent; Electrical Engineering 161 or equivalent. One course. *Staff*

**223. Application Specific VLSI Design. (QR)** Introductory VLSI design course. Modern design methods and technology for implementing application specific integrated circuits (ASICs). Semicustom design methodology, semicustom VLSI technologies such as gate arrays, standard cells, and FPGAs; the use of ASIC Computer Aided Design (CAD) tools. Mapping algorithms into high performance silicone implementation. Prerequisite: course in logic design. One course. *Kedem*

**225. Fault-Tolerant and Testable Computer Systems.** Not open to students who have taken Computer Science 207. Prerequisite: Electrical Engineering 151L or equivalent. See C-L: Electrical Engineering 254. One course. *Marinos*

**226. Mathematical Methods for Systems Analysis I. (QR)** Basic concepts and techniques used in the stochastic modeling of systems. Elements of probability, statistics, queuing theory, and simulation. Prerequisite: four semesters of college mathematics. C-L: Electrical Engineering 255. One course. *Trivedi*

**230. Design and Analysis of Algorithms. (QR)** Design and analysis of efficient algorithms. Algorithmic paradigms. Applications include sorting, searching, dynamic structures, graph algorithms, randomized algorithms. Computationally hard problems. NP completeness. Prerequisite: Computer Science 100 or equivalent. One course. *Agarwal or Reif*

**232. Mathematical Analysis of Algorithms. (QR)** Techniques for efficient implementation and precise analysis of computer algorithms. Combinatorial mathematics and elementary probability. Emphasis on obtaining exact closed-form expressions describing the worst-case or average-case time and space requirements for particular computer algorithms, whenever possible. Asymptotic methods of analysis for obtaining approximate expressions in situations where exact expressions are too difficult to obtain or to interpret. Prerequisites: Mathematics 103 and 104 or equivalents. One course. *Vitter*

**234. Computational Geometry. (QR)** Models of computation and lower-bound techniques; storing and manipulating orthogonal objects; orthogonal and simplex range searching, convex hulls, planar point location, proximity problems, arrangements, linear programming and parametric search technique, probabilistic and incremental algorithms. Prerequisite: Computer Science 230 or equivalent. One course. *Agarwal or Reif*

**235. Topics in Data Compression. (QR)** Emphasis on the redundancies found in textual, still-frame images, video, and voice data, and how they can be effectively removed to achieve compression. The compression effects in information processing. Additional topics may include information theory, the vulnerability of compressed data to transmission errors, and the loss of information with respect to the human visual system (for image data). Available compression technologies and the existing compression standards. Prerequisites: Computer Science 130 and 208 or Computer Science 254 or Electrical Engineering 282. One course. *Markas or staff*

**236. Parallel Algorithms. (QR)** Models of parallel computation including parallel random access machines, circuits, and networks; NC algorithms and P-completeness; graph algorithms, sorting algorithms, network routing, tree contraction, string matching, parsing algorithms; randomization and derandomization techniques. Prerequisite: Computer Science 230 or equivalent. One course. *Reif*

**240. Computational Complexity. (QR)** Turing machines, undecidability, recursive function theory, complexity measures, reduction and completeness, NP, NP-Completeness, co-NP, beyond NP, relativized complexity, circuit complexity, alternation, polynomial time hierarchy, parallel and randomized computation, algebraic methods in complexity theory, communication complexity. Prerequisite: Computer Science 140 or equivalent. One course. *Agarwal*

**250. Numerical Analysis. (QR)** Error analysis, interpolation and spline approximation, numerical differentiation and integration, solutions of linear systems, nonlinear equations, and ordinary differential equations. Prerequisites: knowledge of an algorithmic programming language, intermediate calculus including some differential equations, and Mathematics 104. C-L: Mathematics 221 and Statistics 273. One course. *Rose or Sun*

**252. Numerical Methods for Partial Differential Equations. (QR)** Survey of theory, algorithms, and codes for the numerical solution of nonlinear partial differential equations of initial value and boundary value type. Topics include finite-difference, spectral, and finite-element representations; stability of time-discretization techniques; adaptive spatial meshes; multigrid and preconditioned conjugate gradient techniques; solution on parallel computers. Prerequisite: Computer Science 250. C-L: Mathematics 222. One course. *Rose or Sun*

**254. Numerical Linear Algebra. (QR)** Solution of large, sparse linear systems of equations. Storage schemes, graph theory for sparse matrices, different orderings to minimize fill, block factorizations, iterative methods, analysis of different splittings, conjugate gradient methods. Eigenvalue problems, QR factorization, Lanczos method, power method and inverse iteration, Rayleigh quotient. Prerequisite: Computer Science 250 or equivalent. C-L: Mathematics 223. One course. *Rose or Sun*

**260. Introduction to Computational Science. (QR)** Introduction for students and faculty to computing resources that facilitate research involving scientific computing: contemporary computers, programming languages, numerical software packages, visualization tools, and some basic issues and methods for high performance algorithm design. Prerequisite: programming experience in Fortran or C, calculus, numerical linear algebra or equivalent. One course. *Greenside, Rose, or Sun*

**264. Nonlinear Dynamics. (QR)** Introduction to the study of temporal patterns in nonequilibrium systems. Theoretical, computational, and experimental insights will be used to explain phase space, bifurcations, stability theory, universality, attractors, fractals, chaos, and time-series analysis. Prerequisites: Computer Science 6, Mathematics 111, and Physics 51L, 52L. C-L: Physics 213. One course. *Behringer or Greenside*

**266. Communication, Computation, and Memory in Biological Systems. (QR)** Communication and memory in biological systems: voltage sensitive ion channels, hormone-receptor interactions, and initiation and control of RNA/DNA synthesis. Models of signaling and memory are developed and related to electronic signaling schemes. Prerequisites: Computer Science 100, two semesters of college chemistry, and four semesters of college mathematics. One course. *Starmer*

**270. Artificial Intelligence. (QR)** Heuristic versus algorithmic methods; programming of games such as chess; theorem proving and its relation to correctness of programs; readings in simulation of cognitive processes, problem solving, semantic memory, analogy, adaptive learning. Prerequisite: Computer Science 100 or consent of instructor. One course. *Biermann or Loveland*

**271. Numeric Artificial Intelligence. (QR)** Introduction to the core areas of artificial intelligence from a quantitative perspective. Topics include planning in deterministic and stochastic domains; reasoning under uncertainty, optimal decision making; computer speech, computer vision, and robotics; machine learning, supervised and reinforcement learning; natural language processing; agents. Minimal overlap with Computer Science 270. Prerequisite: Computer Science 100 or consent of instructor. One course. *Littman*

**274S. Computational Linguistics Seminar. (QR)** Readings and research seminar on topics related to the processing of English or other natural languages: syntax, semantics, pragmatics, discourse, and others. Prerequisite: Computer Science 270 or consent of instructor. C-L: Linguistics. One course. *Biermann*

**296. Advanced Topics in Computer Science.** One course. *Staff*



## COURSES CURRENTLY UNSCHEDULED

- 198S. Seminar in Research Practice and Methodology. (QR)
- 242. Logic for Computer Science. (QR)
- 256. Functional Analysis for Scientific Computing. (QR)
- 291. Reading and Research in Systems. (QR)
- 292. Reading and Research in Algorithms and Complexity. (QR)
- 293. Reading and Research in Scientific Computing. (QR)
- 294. Reading and Research in Artificial Intelligence. (QR)

## THE MAJOR

### For the A.B. Degree

*Prerequisites.* Mathematics 31, 32.

*Major Requirements.* Computer Science 6, 100, 104, 108, 110, and 130; two electives at the 100 level or above: one in mathematics, and one in computer science or electrical engineering; and Mathematics 135 or Statistics 112. Suggested sequences to fill these elective slots would be a scientific computing sequence: Mathematics 104 and Computer Science 150, or the general symbolic computation sequence: Mathematics 187 and Computer Science 170 or 198. If Mathematics 135 is elected, it is recommended that it be followed by Mathematics 136. Students must complete at least five additional courses at the 100 level or above (excluding the above listed requirements). The five courses may be a mixture of courses in Computer Science and/or one other department, or with the approval of the director of undergraduate studies, may consist of a coherent plan of courses drawn from multiple departments.

### For the B.S. Degree

*Prerequisites.* Mathematics 31, 32, 103, 104; one of the following pairs of courses: Chemistry 11L, 12L or Physics 51L, 52L or Physics 53L, 54L or Physics 41L, 42L.

*Major Requirements.* Computer Science 6, 100, 104, 108, 110, 130, 140, and 150; two elective courses at the 100 level or above in computer science, electrical engineering, or mathematics; Electrical Engineering 151; Mathematics 135 or Statistics 112; and Mathematics 124 or 187. If Mathematics 135 is selected, it is recommended that Mathematics 136 be taken also.

## Graduation with Distinction

A program for graduation with distinction in computer science is available. Candidates for a degree with distinction, high distinction, or highest distinction must apply to the director of undergraduate studies and meet the following criteria. Candidates for graduation with distinction must have a grade point average of 3.0 or higher in computer science courses numbered above 100. Candidates must complete a substantial project, representing at least one year's work and including at least one independent study, under the guidance of a faculty member in computer science who oversees and endorses the project. The project should represent a significant intellectual endeavor including the writing of a report. A presentation of the project must be made to a committee of three faculty members, two of whom will normally be from computer science although for interdisciplinary projects this restriction can be relaxed. Graduation with high or highest distinction is awarded at the discretion of the faculty committee in consultation with the director of undergraduate studies. Graduation with high or highest distinction is typically awarded for projects that are of publishable quality. In addition, candidates for a degree with high or highest distinction should have a grade point average of 3.5 or higher in those computer science courses related to the area of research; these courses must include at least one course at the 200 level.



## THE MINOR

Five courses in Computer Science (including the prerequisite), at least four of which must be at the 100 level or above.

*Prerequisites.* Computer Science 100E, or both Computer Science 6 and Computer Science 100.

*Requirements.* Computer Science 104; additional courses from the following: Computer Science 108, 110, 130, 150, 170, or any 200-level course.

## INTERNSHIP PROGRAM

The Computer Science Internship Program (CSIP) provides undergraduate computer science majors the opportunity to apply knowledge gained in the classroom to a job, and to build on this knowledge upon their return. The internship period is a two-semester leave consisting of one summer plus the spring semester before or the fall semester following. This period can be extended by one additional semester. One credit can be earned in the semester following the internship period through the independent study course Computer Science 195.

To participate in the CSIP program, students must take Computer Science 104 and 108, and declare computer science as their first major. An application for the CSIP program should be completed at the beginning of the semester prior to the internship period to allow time for interviewing with companies. Approval for Computer Science 195 must be obtained before the internship begins, and a faculty mentor associated with this course must be designated at this time. For further information, contact the Director of the Internship Program, Department of Computer Science.

## Cultural Anthropology (CA)

Professor O'Barr, *Chair*; Associate Professor Allison, *Director of Undergraduate Studies*; Professor Apte; Associate Professors Ewing, Quinn, and Silverblatt; Assistant Professors Baker, Litzinger, Piot, Starn, and Strauss; Professor Emerita Friedl; Assistant Professor of the Practice Luttrell; Adjunct Professors Andrews (Slavic languages), Conley, Mignolo (romance studies), Peacock, and Reddy (history); Adjunct Associate Professor Tetel (English); Lecturer Daniels; Adjunct Lecturer Chandler (English)

A major or minor is available in this department.

Cultural anthropology is a comparative discipline that studies the world's peoples and cultures. It extends perspectives developed from anthropology's initial encounter with the "primitive" world to studies of complex societies including rural and urban segments of the Third World and contemporary industrial countries.

Cultural anthropologists at Duke concentrate on political economy, culture, ideology, history, and discourse, and the relations among them. These concerns lead them to such specific research and teaching interests as: colonialism and state formation; the role of culture in cognition; the politics of representation and interpretation; the bases of ideological persuasion and resistance; gender ideology; language use in institutional contexts; class formation and political consciousness; the creation and use of ethnic and national identities. The department also offers courses that introduce the various traditional subfields of cultural anthropology, and other, integrative courses on world areas. Students without prerequisites for a course may ask the instructor for admission.

**20S. Studies in Special Topics. (SS)** Opportunities for first-year students to engage with a specific issue in cultural anthropology, with emphasis on student writing. Topics vary each semester offered. One course. *Staff*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**60S. Culture and the Brain. (SS)** The interaction of culture and the human brain, focusing on how human brains are shaped by culture, the nature of meaning, connectionist models of cognition, different ways of knowing, and collective thought. Open only to students in the FOCUS Program, Exploring the Mind. One course. *Strauss*

**62S. Culture and Politics in Contemporary Chinese Cinema. (CZ, SS)** An introduction to Chinese film, paying particular attention to its global reception in recent years. How film represents national, ethnic, and regional identities, as well as questions of sexuality and gender relations. Open only to students in the FOCUS Program. One course. *Litzinger*

**64S. Globalization and Latin America. (CZ, SS)** Cultural and political questions at stake in the spread of mass media and entertainment to Latin America. The way the news media, television dramas, and Hollywood movies depict the peoples of Latin America; the emergence of new regional traditions of news coverage, film, and popular entertainment. Open to students in the FOCUS Program. C-L: Latin American Studies. One course. *Starn*

**90S. Considering Identity Using Fiction and Ethnography. (SS)** Relevance to culture and cultural experience as well as individual and group understandings. Special focus on difference and identity as course materials address race, ethnicity, class, gender, and sexuality. Not open to students who have taken this course as Cultural Anthropology 49S. C-L: African and African-American Studies 90S and Women's Studies. One course. *Daniels*

**94. Introduction to Cultural Anthropology. (SS)** Theoretical approaches to analyzing cultural beliefs and practices cross-culturally; application of specific approaches to case material from present and/or past cultures. C-L: Comparative Area Studies. One course. *Staff*

**101, 102. Introduction to the Civilizations of Southern Asia. (CZ)** Not open to students who have taken Religion 160, 161. See C-L: Asian and African Languages and Literature 160, 161; also C-L: Comparative Area Studies, History 193, 194, and Religion 144, 145. One course each. *Khanna*

**103. Sexuality and Culture in America. (SS)** The different cultural contexts that give meaning to and regulate sexuality in America. Topics include the rise of youth culture and its impact on sexual expression; the effects of popular culture and media on sexual beliefs and practices; how different campus cultures shape sexual behaviors and attitudes; and the rise of gay and lesbian culture and politics. C-L: Study of Sexualities, Sociology 103, and Women's Studies. One course. *Luttrell*

**104. Anthropology and Film. (SS)** The study of feature films and documentaries on issues of colonialism, imperialism, war and peace, and cultural interaction. An introduction to critical film theory and film production in non-Western countries. C-L: Film and Video and Perspectives on Marxism and Society. One course. *Litzinger*

**105S. Theme Seminar.** Topics vary. One course. *Staff*

**106. The Anthropology of Everyday Life in America. (SS)** Various popular cultural forms—the game of baseball, the cowboy and the western, the ritual cycle (from Halloween through Easter), the new children's video games (Nintendo, Sega Genesis)—are explored for the way in which they at once reproduce and subvert American ideology. One course. *Piot*

**107. Introduction to Linguistics. (SS)** See C-L: Linguistics 101; also C-L: Comparative Area Studies, and English 111. One course. *Butters or Tetel*

**108. Fantasy, Mass Media, and Popular Culture. (SS)** A cross-cultural study of how images and stories that are mass produced affect the world view, identities, and desires of their consumers. C-L: Comparative Area Studies. One course. *Allison*

- 109. Contemporary Global Issues. (SS)** See C-L: Comparative Area Studies 109; also C-L: History 109, Political Science 160, and Sociology 175. One course. *Staff*
- 110. Advertising and Society: Global Perspective. (SS)** History and development of commercial advertising; advertising as a reflector and/or creator of social and cultural values; advertisements as cultural myths; effects on children, women, and ethnic minorities; advertising and language; relation to political and economic structure; and advertising and world culture. Emphasis on American society complemented by case studies of advertising in Canada, Japan, Mexico, Russia, Western Europe, and selected other countries. C-L: Canadian Studies, Comparative Area Studies, English 120, Film and Video, Linguistics, Sociology 160, and Women's Studies. One course. *Luttrell, O'Barr, or Wilson*
- 111. Anthropology of Law. (SS)** Comparative approach to jurisprudence and legal practice, dispute resolution, law-making institutions and processes, and the relation of law to politics, culture, and values. One course. *Conley or O'Barr*
- 112. Current Topics in Linguistics. (SS)** Advanced study of an area of linguistics or grammar. C-L: English 119 and Linguistics. One course. *Staff*
- 113. Gender and Culture. (SS)** Explanation of differing beliefs about gender cross-culturally, by comparison with dominant themes about gender in our own cultural history and contemporary ideological struggles. C-L: Perspectives on Marxism and Society, Study of Sexualities, and Women's Studies. One course. *Allison, Luttrell, Quinn, or Silverblatt*
- 114. Languages of the World. (SS)** See C-L: Linguistics 102; also C-L: Comparative Area Studies, and English 114. One course. *Andrews or Tetel*
- 115S. The Anthropology of Gender: Special Topics. (SS)** Topics to be selected each semester from: gender myths; gender in mass media; science, gender, and culture; gender, work, and family; gender and the state; and others. C-L: Women's Studies. One course. *Allison, Luttrell, Quinn, Silverblatt, or Starn*
- 116. Anthropology and Public Policy. (SS)** The way public policies rest on widely held but unstated cultural assumptions, for example, about nature, gender, families, the economy, and the relation of individuals to society. Focus on cultural models affecting public policy in the United States now, with selected cases from other societies and historical periods for comparison. One course. *Strauss*
- 117. Global Culture. (SS)** Globalization examined through some of its dominant cultural forms—the marketing of pop music, the dissemination to TV culture, the spread of markets and commodities, the export of political ideologies. Special attention given to the implication of globalization for individual and group identity. C-L: Comparative Area Studies and Perspectives on Marxism and Society. One course. *Piot*
- 119. Language, Culture, and Society. (SS)** Analysis of language behavior within and across societies. Topics include the relation of language structures to cultural values, the role of speech in expressing and creating relations of power and intimacy, and the way social ideologies shape different kinds of discourse. C-L: Comparative Area Studies and Linguistics. One course. *Apte, O'Barr, or Strauss*
- 120. South Asia: Institutions and Change. (CZ)** Cultures and societies of India, Pakistan, Sri Lanka, Bangladesh, Nepal, and Bhutan with emphasis on social institutions, behavioral patterns, value systems, and sociocultural change. C-L: Comparative Area Studies. One course. *Apte or Ewing*
- 122. Culture and Politics in Africa. (CZ)** Cultures and societies of Africa through the study of kinship, politics, economics, ecology, religion, and aesthetics in the context of colonialism



and postcolonialism. C-L: African and African-American Studies 122, Comparative Area Studies, and Perspectives on Marxism and Society. One course. *Piot*

**124. American Indian Peoples. (CZ)** Past and contemporary conditions of American Indian life, with an emphasis on North America. Social and political organization, gender relations, changing economic patterns, cultural themes and variations, spirituality, the effects of anti-Indian wars, policies, and prejudice, and the emergence of movements for self-determination. C-L: Comparative Area Studies. One course. *Staff*

**125. Comparative Approaches to Global Issues. (CZ, SS)** Not open to students who have taken Religion 121. See C-L: Comparative Area Studies 125; also C-L: History 137, Perspectives on Marxism and Society, Political Science 125, Religion 183, and Sociology 125. One course. *Staff*

**126. Muslim World: Transformations and Continuities. (SS)** The diversity of social practices within the community of Islam. Particular emphasis on gender relations, religious movements, and social change. C-L: Comparative Area Studies, Religion 119, and Women's Studies. One course. *Ewing*

**127. Culture and Politics in Japan. (CZ)** The intersection between Japanese economic and political institutions and the cultural conventions that establish and challenge Japanese identity in the 1990s. C-L: Comparative Area Studies and Perspectives on Marxism and Society. One course. *Allison*

**128. Culture and Politics in Latin America. (CZ)** Key themes in Latin American societies, including art, literature, history, violence and human rights, economic development, and rebellion and revolution. C-L: Comparative Area Studies and Perspectives on Marxism and Society. One course. *Starn*

**129. Introduction to North America. (CZ, SS)** See C-L: North American Studies 110; also C-L: Economics 115, History 108F, Latin American Studies, Political Science 119, Public Policy Studies 115, Romance Studies 125, and Sociology 109. One course. *Thompson*

**130. Modernity, Ethnicity, and Colonization. (AL, CZ)** See C-L: Romance Studies 124; also C-L: African and African-American Studies 123, Canadian Studies, and Comparative Area Studies. One course. *Mignolo or staff*

**131S. Documentary Film/Video Theory and Practice. (AL)** Prerequisite: Drama 173, English 101A, Literature 110, or Literature 111S. See C-L: Film and Video 104S; also C-L: English 101C. One course. *Staff*

**134S. American Communities: A Documentary Video Approach. (AL, SS)** Prerequisites: English 101A and any one of the following: Film and Video 100S, 101S, or 104S. See C-L: Film and Video 105S; also C-L: History 150B, Political Science 156S, and Public Policy Studies 105S. One course. *Staff*

**135. American Culture: Myths and Values. (SS)** Examination of the major values said to characterize Americans—self-reliance, success, equality, and self-realization, among others—tracing their persistence and change; considering their force as cultural myths and the beliefs and conflicts they engender around such matters as race and gender, community and family life, parenting and individual conduct; and illuminating the American pattern by its comparison with other strategically selected cases. One course. *Quinn or Strauss*

**137. Gender Inequality. (SS)** Assessment of anthropological findings since the 1970s that critique the assumption of universal male dominance and point to a multivariate approach to gender differences, gender relations, and women's position cross culturally. C-L: Comparative Area Studies and Women's Studies. One course. *Allison, Luttrell, Quinn, or Silverblatt*



**138. Religious Movements. (CZ, SS)** Religious responses to modernity and colonialism. Religion and social change in complex societies. The psychology and politics of conversion. C-L: Religion 173. One course. *Ewing*

**139. Marxism and Society. (SS)** A critical appraisal of Marxism as a scholarly methodology for understanding human societies. The basic concepts of historical materialism, as they have evolved and developed in historical contexts. Topics include sexual and social inequality, alienation, class formation, imperialism, and revolution. Core course for the program in Perspectives on Marxism and Society. C-L: Comparative Area Studies, Education 139, History 186, Literature 181, Perspectives on Marxism and Society, and Sociology 139. One course. *Staff*

**140S. Cultural Diversity in the Andes. (CZ, FL)** (Taught in Bolivia.) See C-L: Spanish 140C; also C-L: Comparative Area Studies. One course. *Staff*

**141. Self and Society. (SS)** The nature of human social identities, the contexts in which they are shaped, and the processes by which they change. C-L: Psychology 113A and Women's Studies. One course. *Apte, Ewing, or Luttrell*

**142. Sexuality in Global Perspective. (SS)** Cross-cultural perspectives on the meaning, regulation, and politics of sexuality. Course materials drawn from historical-comparative and ethnographic sources with emphasis on variations in how masculinity and femininity are represented; what is considered erotic; how heterosexuality and homosexuality are defined; impact of Western notions about sexuality on the lives of people in Third World countries. C-L: Comparative Area Studies, Study of Sexualities, and Women's Studies. One course. *Luttrell*

**143. Education, Culture, and Identity. (SS)** How social divisions and inequalities are created and challenged through the schooling process. Primary emphasis on American education. C-L: African and African-American Studies 143 and Education 143. One course. *Luttrell*

**146. East Asian Cultural Studies. (AL, CZ)** See C-L: Asian and African Languages and Literature 153; also C-L: Comparative Area Studies. One course. *Staff*

**147, 148. Introduction to Islamic Civilization. (CZ)** Not open to students who have taken Religion 162, 163. See C-L: Religion 146, 147; also C-L: Comparative Area Studies, History 101G, 102G, and Medieval and Renaissance Studies. One course each. *Cornell, Lawrence, and staff*

**150. Religion and Spirituality in the African Diaspora. (CZ, SS)** See C-L: African and African-American Studies 150; also C-L: Religion 160. One course. *Daniels*

**151. Culture and Thought. (SS)** The cultural basis of understanding, including feeling, motivation, and cognitive tasks such as reasoning and categorizing. Reconstruction of cultural assumptions from discourse. Evidence for cross-cultural variation and cultural universals in human thought. C-L: Psychology 113C. One course. *Quinn or Strauss*

**161. Anthropological Approaches to Religion. (SS)** The social, cultural, and political forces that shape religious practices and individual religious experience in contemporary societies. C-L: Religion 118. One course. *Ewing*

**163. Foundations of Chinese Civilization. (CZ)** The contemporary experience in China and its relation to ethnic, spiritual, social, aesthetic, moral, political, and economic themes in China's past. (Taught in China.) Not open to students who have taken History 163. C-L: Comparative Area Studies. One course. *Staff*

**165. Psychological Anthropology. (SS)** The influence of society on human personality and cognition. Theoretical and ethnographic studies used to explore topics that may include

gender, sexuality, emotions, parent-child interaction, the effect of language on thought, and the universality of the "self." C-L: Psychology 113B. One course. *Ewing or Strauss*

**166. Cross-Cultural Perspectives on Development: A View from Japan.** (SS) See C-L: Psychology 132B. One course. *Mazuka*

**174. Gender and Language.** (SS) See C-L: Russian 174; also C-L: English 115, Linguistics, and Women's Studies. One course. *Andrews*

**180. Current Issues in Anthropology.** (SS) Selected topics in methodology, theory, or area. One course. *Staff*

**180S. Current Issues in Anthropology.** (SS) Same as Cultural Anthropology 180 except instruction is provided in seminar format. One course. *Staff*

**182. Contemporary European Issues.** (CZ, FL) (Taught in Spain.) See C-L: Spanish 133; also C-L: Comparative Area Studies. One course. *Staff*

**184S. Canadian Issues.** (SS) Prerequisite: Canadian Studies 98 or consent of instructor. See C-L: Canadian Studies 184S; also C-L: Comparative Area Studies, Economics 184S, History 184S, Political Science 184S, and Sociology 184S. One course. *Staff*

**185S. The Canadian Health Care System.** (SS) See C-L: Canadian Studies 185S; also C-L: Comparative Area Studies, Economics 185S, History 108E, Political Science 185S, Public Policy Studies 187S, and Sociology 185S. One course. *Warren*

**189S. Crossing Cultures.** (SS) Exploration of students' cross-cultural experience during study abroad; readings in communication, culture, ethnic and personal identity, colonialism, postcolonialism and modernization, problems of translation, the possibility of transcendence of local cultures, and multiculturalism at home in America. Prerequisite: completion of a study abroad program. C-L: Comparative Area Studies. One course. *Staff*

**190. Theoretical Foundations of Cultural Anthropology.** (SS) Major schools and theories of cultural anthropology. Normally taken in sophomore or junior years. C-L: Comparative Area Studies. One course. *Staff*

**191A. S. Feminist Ethnography.** (SS) The development of and debates within feminist ethnography focusing on issues of objectivity, truth, authority, ethnographic representation, and responsibility. C-L: Comparative Area Studies and Women's Studies. One course. *Luttrell*

**192S. Latin American Culture(s).** (SS) The changing and varied faces of culture and tradition in Latin America. Spanish, indigenous, African, and Asian influences that have defined, clashed, and mingled in the subcontinent; poetry and novels as well as work by anthropologists, historians, and other scholars. Some previous coursework or experience in Latin America desirable, but not required. One course. *Starn*

**193. Independent Study.** Directed reading and research. Open only to qualified seniors, with consent of director of undergraduate studies. One course. *Staff*

**195S, 196S. Senior Seminar.** Consent of director of undergraduate studies required. One course each. *Staff*

**199A. S. The Articulation of Culture in the Bolivian Andes.** (FL, SS) (Taught in Bolivia.) See C-L: Spanish 132A; also C-L: Latin American Studies. One course. *Staff*

**199B. Bolivian Cultural Anthropology.** (FL, SS) The diverse indigenous cultures of Bolivia, the organization of ethnic groups and indigenous communities, with emphasis on the Andean "ayllu." Focus on markets, rallies, community groups, states, and armies. The

relationship between culture and power. (Taught in Bolivia.) C-L: Latin American Studies. One course. *Staff*

**199C. Bolivian Culture. (CZ, FL)** History of the peoples of Bolivia, the most Indian of the Latin American republics. Special emphasis on the multiethnic and largely rural society. The Spanish colonial past and the predominance of Amerindian languages such as Quéchuá and Aymara and the occurrence of some pre-Incan languages. The complex amalgam of Western and non-Western cultures. (Taught in Bolivia.) C-L: Latin American Studies. One course. *Staff*

**199E. S. Colonialism, Ethnicity, and Gender in Postrevolutionary Bolivia. (CZ, FL)** (Taught in Bolivia.) See C-L: Sociology 188B; also C-L: Latin American Studies, Spanish 132B, and Women's Studies. One course. *Staff*

### **For Seniors and Graduates**

**201S. Marxism and Anthropology. (SS)** The interaction of Marxist and anthropological theory over the last half century; particular attention to evolution, historical transformation, mode of production, labor processes, culture, ideology, and consciousness. One course. *Staff*

**202. Semiotics of Culture. (AL, CZ)** See C-L: Russian 202; also C-L: English 206. One course. *Andrews*

**207S. Anthropology and History. (SS)** Recent scholarship that combines anthropology and history, including culture history, ethnohistory, the study of mentalité, structural history, and cultural biography. The value of the concept of culture to history and the concepts of duration and event for anthropology. Prerequisites: major in history, one of the social sciences, or comparative area studies; or graduate standing. C-L: History 210S. One course. *Reddy*

**208S. Postcolonial Anthropology. (SS)** Interdisciplinary approach to the review and critique of postcolonial ethnography and historiography. How postcolonial scholarship questions historical modes of cultural ordering and representation and envisions new modes of reading and writing in relation to global structures of domination. C-L: Latin American Studies. One course. *Ewing, Litzinger, Silverblatt, or Starn*

**210S. Ideology and the Image in Ethnographic Film. (SS)** Overview of the history of ethnographic film. Emphasis placed on knowledge of the film canon, recent innovations in ethnographic documentation, and critical skills for understanding the political and epistemological quandaries of representation. Topics such as narrativity, authorship, spectatorship, and psychoanalytic and feminist film criticism explored in relation to ethnographic film theory and practice. C-L: Film and Video. One course. *Litzinger*

**215S. The Anthropology of Gender: Theoretical Issues. (SS)** Topics to be selected each semester from: feminist theory and anthropology; Marxism and feminism; gender, ideology, and culture; gender and colonialism; gender and the third world; and others. C-L: Women's Studies. One course. *Allison, Luttrell, Quinn, Silverblatt, or Starn*

**216S. Gender, Race, and Class. (SS)** Gender, race, and class as theoretical constructs and lived experiences. Analytical frameworks include social history, discourse analysis, critical theory, cultural studies, and feminist theories. Consent of instructor required. C-L: African and African-American Studies 216S, Study of Sexualities, and Women's Studies. One course. *Luttrell*

**218S. American Marriage: A Cultural Approach. (SS)** Americans' cultural understandings of marriage and its central place in American life and relation to American ideas about fulfillment, commitment, autonomy, love, and gender roles. One course. *Quinn*



**232S. Historical and Anthropological Approaches to Emotion. (CZ)** See C-L: History 232A. One course. *Reddy*

**234S. Political Economy of Development: Theories of Change in the Third World. (SS)** See C-L: Political Science 234S; also C-L: Comparative Area Studies, History 234S, and Sociology 234S. One course. *Staff*

**249S. Anthropology and Psychology. (SS)** The necessity of psychology to any adequate theory of cultural processes, and the application of psychological theory from cognitive studies, social psychology, psychoanalysis, and other fields to anthropological questions including culture acquisition, cultural universals, culturally expressed psychic conflicts, gender, sexuality, and variability and stability in culturally shared thoughts, emotions, and motivations. C-L: Psychology 249S. One course. *Quinn or Strauss*

**250S. Culture and Discourse. (SS)** Theoretical approach to culture and methods for the investigation of culture through analysis of discourse, especially interview texts. Application of this approach and these methods to the study of a domain of American culture. C-L: Linguistics. One course. *Apte, Ewing, O'Barr, Quinn, or Strauss*

**251. Cognitive Anthropology. (SS)** A cognitively-based theory of culture, its history, justification, substantiation through discourse analysis, application to everyday understanding, feeling and motivation, and implications for the acquisition of culture, cross-cultural variation, and cultural universals in human thought. Not open to students who have taken Cultural Anthropology 151. One course. *Quinn or Strauss*

**253S. Person-Centered Interviewing. (SS)** Strategies for effective interviewing, including how to establish rapport, ask productive questions, recognize nonverbal communications, and interpret data using various theoretical models. Students are required to conduct several interviews during the semester. Consent of instructor required. One course. *Ewing*

**254. East Asian Cultural Studies. (AL, CZ)** See C-L: Asian and African Languages and Literature 253; also C-L: Comparative Area Studies. One course. *Staff*

**255. Anthropology as Public Discourse. (SS)** The historic role of science in general and anthropology in particular in shaping U.S. public discourse on culture, immigration, race, and ethnicity. Anthropological texts within their historical and political contexts; how policy experts, pundits, legislators, and others appropriate anthropological ideas for specific agendas. C-L: African and African-American Studies 255. One course. *Baker or Strauss*

**260. Modern Japanese Literature and Culture. (AL, CZ)** See C-L: Asian and African Languages and Literature 262; also C-L: Comparative Area Studies. One course. *Ching or Yoda*

**262S. Anthropology and Folklore. (SS)** Origins, conceptualizations and theoretical orientations, methodology, and subject matter of the discipline of folklore and exploration of its similarities with and differences from sociocultural anthropology. One course. *Apte*

**263. The Bestseller: Cultural Populism in the 1990s' China. (AL)** See C-L: Asian and African Languages and Literature 259; also C-L: Literature 279. One course. *Wang*

**265S. Anthropological Approaches to Life History. (SS)** Form and function of life history and its linkages to sociocultural systems; methodology for collecting life history in ethnographic fieldwork; textual, social-structural, and interpretive analyses of life history. One course. *Apte*

**270S. Non-Western Indigenous Anthropology. (SS)** An examination of the development of indigenous anthropology in non-Western societies with a focus on the theoretical, methodological, and ideological orientations of its practitioners in the context of nationalism, neo-colonialism, and globalization. One course. *Apte*



**279S. Race, Racism, and Democracy. (SS)** The paradox of racial inequality in societies that articulate principles of equality, democratic freedom, and justice for all. C-L: African and African-American Studies 279S. One course. *Baker*

**280S, 281S. Seminar in Selected Topics.** Special topics in methodology, theory, or area. Consent of instructor required. One course each. *Staff*

**282S. Canada. (SS)** See C-L: Canadian Studies 282S; also C-L: Comparative Area Studies, Economics 282S, History 282S, Political Science 282S, and Sociology 282S. One course. *Staff*

**283S. Seminar in North American Studies. (CZ)** See C-L: North American Studies 283S; also C-L: History 283S, Political Science 285S, Public Policy Studies 282S, Romance Studies 283S, and Sociology 283S. One course. *Staff*

**288S. Seminar in Asian and African Cultural Studies. (CZ)** See C-L: Asian and African Languages and Literature 200S; also C-L: African and African-American Studies 200S, and Literature 200S. One course. *Staff*

**290. Research Methods in Japanese. (SS)** Consent of instructor required. See C-L: Japanese 291; also C-L: History 292, Political Science 291, and Sociology 291. One course. *Staff*

## **COURSES CURRENTLY UNSCHEDULED**

**94S. Introduction to Cultural Anthropology. (SS)**

**121. Culture and Politics in China. (CZ, SS)**

**123. Societies of Mediterranean Europe. (CZ)**

**132. Anthropology of Peace and War. (SS)**

**133S. Critical Perspectives on Ethnography. (SS)**

**144. The Anthropology of Race. (SS)**

**145. Medical Anthropology. (SS)**

**164. Peasantry and Peasant Movements. (SS)**

**173. Revolutions in Latin America. (CZ)**

**206S. Anthropological Controversies. (SS)**

**211S. Ethnography of Communication. (SS)**

**214. Postmodernism and the Problem of Representation. (SS)**

**219. Language and Social Theory. (SS)**

**220S. Theoretical Bases of Social Interpretation. (SS)**

**239. Culture and Ideology. (SS)**

**258S. Theories of Symbolism. (SS)**

**261. Religion: Tradition and Cultural Innovation. (SS)**

**272S. Marxism and Feminism. (SS)**

## **THE MAJOR**

*Major Requirements.* A total of ten courses distributed in the following manner: Cultural Anthropology 94 and 190; four courses at the 100 level and above, taught by faculty with an appointment in the Cultural Anthropology Department; two courses at the 190 level and above, at least one taught by faculty with an appointment in the Cultural Anthropology Department; two courses in cultural anthropology. One of these courses must be at the 100 level and above; both may be courses cross-listed from another department.

*Suggested Work in Related Disciplines.* Related courses in other departments are strongly advised. Each student's advisor will recommend a program of related work to complement the student's concentration and interests in cultural anthropology.

## **Graduation with Distinction**

The department offers an intensive and personalized graduation with distinction program to qualified seniors, who research and write a senior thesis on a topic of their own

choice in close collaboration with members of the cultural anthropology faculty. Admission to the program requires a 3.0 grade point average overall and a 3.3 grade point average in the major, both of which must be maintained to graduation for the student to be eligible for distinction. Qualified juniors will be notified each year by the director of undergraduate studies about their eligibility. To pursue distinction, students must then enroll in the senior seminar, Cultural Anthropology 195S and Cultural Anthropology 196S, in the fall and spring of their senior year, where they will learn about research methods and prepare a thesis. Credit for Cultural Anthropology 195S and Cultural Anthropology 196S is given for a passing grade whether or not the student is awarded distinction. The thesis can be based on original fieldwork on a topic of the student's choice, archival or library research, or some combination of various anthropological methods. Previous topics have ranged from studies of the influence of feminism in cultural anthropology to causes of revolution in Latin America and patterns of socialization of Mormon youth in Utah. The student also forms a supervisory committee for the thesis during the fall of the senior year. It should consist of three faculty members who offer the student advice and support in preparing the thesis. At least two of the members must be faculty from the cultural anthropology department. Due in April of the senior year, the thesis must be judged of at least B+ quality by the supervisory committee to receive distinction. In addition, the student must pass an oral examination on the thesis, which is given on its completion by the supervisory committee. Students who fulfill the above requirements graduate with distinction in cultural anthropology.

A typical sequence would be: select a research topic; take the senior seminar in fall and spring; form a supervisory committee; complete the research and writing by April and submit the final draft to the supervisory committee; schedule the oral defense for some time in early or mid-April; defend the thesis in an oral examination given by the supervisory committee.

## THE MINOR

*Requirements.* A total of five courses distributed in the following manner: Cultural Anthropology 94; three courses at the 100 level and above taught by faculty with an appointment in the Cultural Anthropology Department; and one additional course at any level taught by faculty with an appointment in the department (this may include courses taken in the FOCUS program).

## Dance (DAN)

Associate Professor of the Practice Dickinson, *Director of the Program*; Associate Professor of the Practice Dorrance, *Director of Undergraduate Studies*; Professor of the Practice Taliaferro; Associate Professor of the Practice Sommer; Assistant Professor of the Practice Childs; Instructors Vinesett and Walters

A minor, but not a major, is available in this program.

The Dance Program offers its students the opportunity to study modern dance, ballet, dance history, choreography, repertory, and non-Western dance forms in an environment that challenges the student's intellectual, expressive, and physical capabilities. A balanced integration between the creative/performance and the historical/theoretical aspects of dance is emphasized. Academic courses in dance provide a historical and theoretical foundation for the student's creative work. In turn, the student's participation in dance creation and performance, and the development of technical skill, deepen the student's scholarly appreciation of the medium. With this approach the aim of the program is to develop students who are sensitive physical communicators of the visual art of dance and who are articulate spokespeople for the art form.

Courses in technique and performance (partial credit courses) and theory courses (whole course credit) are offered. Dance theory courses fulfill seminar and the arts and literature area of knowledge requirements. Courses in technique and performance may be repeated for

credit. A maximum total of four course credits (made up of partial credit courses) in technique and performance courses may count toward the thirty-four courses required for graduation.

The minor is available to all students in the program who meet the following requirements. To earn the minor in dance, students take six course credits: one year (equivalent of one course credit) of Dance 81 (Repertory), and five full-credit courses including 101 (Introduction to Dance); either 129S (Dance as a Western Theater Art before 1900) or 131S (Modern Dance: History and Theory I) or 133 (History of African American Dance); 135S (Dance Composition); and two additional courses in dance at the 100 level or above. The student is expected to attain and/or maintain the high intermediate level of either modern dance or ballet technique.

Students are urged to enroll in at least one summer session with the American Dance Festival. If appropriate to the student's specific course of study, one course credit earned at the American Dance Festival may be counted toward the requirements of the minor.

Through the Duke in New York Arts Program, a student has the opportunity in the fall semester of the junior or senior year to pursue the study of dance in New York City. Appropriate courses taken at New York University may fulfill requirements of the minor.

### **Courses in Technique and Performance**

**60. Beginning Modern Dance I.** A movement course exploring modern dance through technique, improvisation, and composition. No previous dance experience necessary. Half course. *Staff*

**61. Beginning Modern Dance II.** Prerequisite: Dance 60 or equivalent. Half course. *Staff*

**62. Intermediate Modern Dance I.** Increased complexity of movement sequences and greater emphasis on clarity of expression and quality of performance. Prerequisite: Dance 61 or equivalent. Half course. *Staff*

**63. Intermediate Modern Dance II.** Continuation of Dance 62. Prerequisite: Dance 62 or equivalent. Half course. *Staff*

**64. Advanced Modern Dance.** Prerequisite: Dance 63 or equivalent. Half course. *Staff*

**67. Intermediate Tap Dance Technique.** Prerequisite: minimum one year of study in tap dance. Half course. *Staff*

**68. Ballet Fundamentals.** Fundamentals of classical ballet technique concentrating on correct placement and body alignment within the ballet vocabulary. No previous dance experience necessary. Half course. *Dorrance or Walters*

**69. Elementary Jazz Dance.** No previous dance experience required. Half course. *Childs*

**70. Elementary/Intermediate Ballet.** Barre work concentrating on body alignment and correct placement within the ballet vocabulary followed by center adagio and allegro sequences. Prerequisite: Dance 68 or equivalent. Half course. *Dorrance*

**71. Intermediate/Advanced Ballet.** Greater complexity of barre and center sequences with increased emphasis on correctness of style and quality of performance. Prerequisite: Dance 70 or equivalent. Half course. *Dorrance or Walters*

**72. Intermediate Jazz Dance.** Prerequisite: Dance 69 or equivalent. Half course. *Childs*

**73. Advanced Ballet.** Progression of Dance 71 with increased emphasis on line, style, and performance-level quality and technique. Diverse batterie, pirouettes, and tours included in allegro combinations. Prerequisite: Dance 71 or equivalent. Half course. *Dorrance or Walters*

**76. Flamenco.** Introductory course presenting one of the three basic genres of Spanish dance: flamenco. Style, posture, techniques, and footwork; some historical background of the genre. Half course. *Staff*

**78. African Dance Technique I.** Introduction to West African dance styles. Half course. *Vinesett*

**79. African Dance Technique II.** Greater complexity of movement sequences, rhythm, gesture, and technique with a focus on clarity of expression and quality of performance. Prerequisite: Dance 78 or consent of instructor. Half course. *Vinesett*

**80. Individual Dance Program: Special Topics.** Half course. *Staff*

**81. Repertory.** The study of choreography and performance through participation in the mounting of a dance work from inception through rehearsal to performance. Consent of instructor required. Variable credit. *Staff*

### Theory Courses

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**75. Theater Production and Management. (AL)** Not open to students who have taken Drama 71 or 186. See C-L: Drama 93. One course. *Catotti*

**101. Introduction to Dance. (AL)** The many facets of dance, specifically dance as a theatre art. Topics include movement analysis, anthropology of dance, modern dance and ballet traditions, choreographic process, critics and dance criticism, training and life of a dancer, and dance and the other arts. The course format includes lecture, discussion, video analysis, and movement sessions. One course. *Dickinson or Sommer*

**129S. A History of Ballet before 1900. (AL)** A history of European ballet from the time of the Renaissance dancing master through ballet d'action, the Romantic Ballet, and Petipa and classical ballet in Russia. One course. *Dickinson*

**131S. Modern Dance: History and Theory I. (AL)** Modern dance, through the philosophy and work of its major artists considered in relation to the other arts and the sociopolitical climate of the period 1890 to 1950. One course. *Staff*

**132S. Modern Dance: History and Theory II. (AL)** See 131S, but from 1950 to the present. One course. *Staff*

**133. History of African-American Social Dance Forms of the Twentieth Century. (AL)** The evolution of African-American dance styles from the late 1890s to the 1990s in such dances as the Cakewalk, Charleston, Lindy Hop/Jitterbug through Bebop, Rock'n'Roll, Breaking, Popping, and current Freestyle forms. The influence of these popular forms on stage dance from ballet to jazz, and on movement styles of the younger generation throughout the world. C-L: African and African-American Studies 133. One course. *Sommer*

**135S. Dance Composition. (AL)** The basic elements of movement (time, space, weight, flow) and their choreographic applications explored through structured improvisation, short movement studies, viewing of videotaped dances, and selected readings. Experimentation with devices for movement manipulation and choreographic forms through longer movement studies. Prerequisite: a beginning level dance technique course (modern, ballet, jazz, or African) or consent of instructor. One course. *Childs or Dickinson*

**136S. Advanced Dance Composition. (AL)** Continuation of the basic elements of movement, choreographic devices and forms explored in 135S. The use of props, sets, lighting and costuming; the relationship of music to dance. Choreographing and directing ensembles. Prerequisite: Dance 135S or consent of instructor. One course. *Childs or Dickinson*



**146S. Dancing in the Movies. (AL)** Dance styles as they have evolved in American cinema from the choreography of Charlie Chaplin to the geometric chorus lines of Busby Berkeley to the glorious partnership of Astaire and Rogers. The evolution of the musical extravaganzas of such dancers as Gene Kelly and Michael Kidd to the sleek jazz of Bob Fosse and Jerome Robbins, and the choreographed battles of Kung Fu flicks. C-L: Film and Video. One course. *Sommer*

**151. Functional Anatomy for Dancers. (AL)** The functional anatomy of the musculoskeletal system (muscles, bones, and joints) as specifically applied to dance technique approached through observation, analysis, and movement exploration. Concepts of efficient use and questions of misuse of the body in motion or at rest. One course. *Staff*

**169S. Design for the Theater.** Not open to students who have taken the former Drama 169S. Prerequisite: Drama 93 or consent of instructor. See C-L: Drama 161S. One course. *Catotti and Ma*

**181. Special Topics.** Content to be determined each semester. Consent of instructor required. One course. *Staff*

**181S. Special Topics.** Content to be determined each semester. Consent of instructor required. One course. *Staff*

**182S. Choreography. (AL)** Advanced study in dance composition designed to develop the student's personal mode of expression. Prerequisites: Dance 135S, Dance 136S, and consent of instructor. One course. *Childs, Dickinson, or Taliaferro*

**188S. The Diaghilev Ballet, 1909-1929. (AL)** The Diaghilev Ballet as a focal point for modernist movements in the arts and a revitalizing force for ballet that brought together choreographers Fokine, Nijinsky, Massine, Nijinska; composers Stravinsky, Ravel, Debussy, Satie; artists Bakst, Benois, Picasso, Braque. Prerequisites: junior or senior standing or consent of the instructor. One course. *Dickinson and staff*

**189S. Dance Criticism: From Stage to Page. (AL)** The theories and practicalities of how to look at and write about dance performance, ranging from ballet and modern dance to Step shows, clubs, and postmodern performance art. One course. *Sommer*

**191, 192. Independent Study.** Individual intensive research or creative projects. Consent of instructor required. Half or one course. Variable credit. *Staff*

**200. Senior Project. (AL)** A research paper, project, or program (with appropriate written documentation) under dance faculty supervision. Open only to seniors earning a minor in dance. One course. *Staff*

## **COURSES CURRENTLY UNSCHEDULED**

**65. Beginning Improvisation.**

**134. Creative Movement for Children.**

**197. Aesthetics of Twentieth-Century Dance. (AL)**

**198. Sacred Dance. (AL)**

## **Distinguished Professor Courses (DPC)**

Distinguished professor courses enable students, regardless of their majors, to study with some of the most outstanding teachers and scholars within the university. The courses often focus on topics of broad intellectual and academic interest beyond the scope of a single discipline. They may count toward the appropriate distributional requirements as indicated.

**180S. Culture Heroes Across Cultures. (AL)** Myths and folktales of the "culture hero" from a cross-cultural perspective, including the ancient societies of the Near East and Mediterranean as well as early modern and contemporary cultures in Africa, the Caribbean, and North America. C-L: African and African-American Studies 172S and Classical Studies 174S. One course. *Davis*

**185S. Ethical Issues in Early Christianity. (CZ)** Investigation of two major transitions in the early Christian movement and their impact on the formulation of Christian ethics: Christianity's transition from a sect within Judaism to a Greco-Roman religious movement whose constituency came largely from the "pagan" world, and its transition from a sect in danger of persecution to a religion favored and supported by Roman imperial authorities. How these transitions are reflected in early Christian attitudes toward, and practices concerning, poverty and wealth, war and military service, marriage and sexuality, capital punishment, slavery, and other issues. Also taught as Religion 185S. One course. *Clark*

**190S. The Pagan World of the Divine Comedy. (AL)** Dante's *Commedia* and the texts that place it in a context: the history of thirteenth-century Florence and Dante's life; his other major works (the *Vita Nuova* and *De Monarchia*); the pagan poets whom Dante incorporated into his *Commedia* (Vergil, Ovid, Lucan, and Statius) and the Christian theory of biblical criticism that gave St. Augustine his perspective on pagan poets. C-L: Classical Studies 116S and Medieval and Renaissance Studies. One course. *Clay*

**192. French Existentialism: 1940-1960. (AL, CZ)** A critical introduction to the chief positions and controversies of French existentialism. Taught in English. C-L: Comparative Area Studies. One course. *Mudimbe*

**200S. Democracy and American Foreign Policy. (SS)** Focuses on an issue that has been widely debated by statesmen and scholars: Are democracies at an inherent disadvantage in the conduct of foreign relations? Case studies on important American foreign policy undertakings serve as a major source of reading and discussion. Open to juniors and seniors who have not taken Political Science 200D,S.11; also taught as Political Science 200D,S.11. Consent of instructor required. One course. *Holsti*

**207S. Topics in Psychobiology. (SS, NS)** The biological substrates of human behavior in health and disease. Drug abuse, alcoholism, depression, schizophrenia, and human aggression. Films and videotapes. Student presentations; patient interviews. Prerequisites: senior standing, Psychology 49S (Psychobiology), and consent of instructor. C-L: Psychology 207S. One course. *Brodie*

## COURSES CURRENTLY UNSCHEDULED

**197S. The Family in Christian History. (CZ)**

**198S. The Discovery of the Old World: Utopias Ancient and Modern. (AL)**

**202S. What It Means to Be Human. (SS)**

**222. Reading Milton. (AL)**

## Documentary Studies

See the chapter "Special Study Centers, Programs, and Opportunities" for information on courses in documentary studies.

## Drama Program (DRA)

Professor of the Practice Riddell, *Director of the Program*; Professor of the Practice Clum, *Director of Undergraduate Studies*; Professor of the Practice Randall; Associate Professors of the Practice McAuliffe and Storer; Assistant Professors of the Practice Blackadder, Ma, Voss, and Wilson; Adjunct Assistant Professor of the Practice Catotti; Adjunct Professor Azenberg;

Adjunct Lecturers Francis, Randolph, and Webb; Instructors Froeber, Hemphill, Lopez-Barrantes, Morris, Schilling, and West.

A major or a minor is available in this program.

The program in drama seeks to educate students in the historical and creative aspects of the theater. Drama courses are designed to give majors a broad background necessary for advanced professional or scholarly work and to offer nonmajors the opportunity to deepen their understanding and appreciation of the theater. Guiding the work of the faculty is the belief that the theater is a collaborative art form that reaches out to other disciplines. Emphasis is placed on classwork, studio projects, and production opportunities. To keep students abreast of the changing nature of theater, resident professionals and visiting artists regularly hold workshops, teach classes, and participate in the production program.

## INTRODUCTORY COURSES

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**91. The Theater. (AL)** An introduction to the study of theater. Aspects of play production, text analysis, and an introduction to the key periods in the history of theater (classical Greek, English Renaissance, modern European, and contemporary), including close analysis of four representative plays. Requires involvement with one Drama Program production. Not open to students who have taken Drama 51. C-L: English 94. One course. *Clum or Riddell*

**93. Theater Production and Management. (AL)** Fundamentals of theater technology and production. Focus is on familiarity with theater spaces and the areas of production (scenery, costumes, lighting, sound, props, and stage management) as well as on a working knowledge of techniques and organizational methods specific to theater. Laboratory requirement. Not open to students who have taken Drama 71 or 186. C-L: Dance 75. One course. *Catotti*

**99S. Introduction to Performance. (AL)** Storytelling and exploration of the self including: movement, voice, imaginative work, and the basic actor's vocabulary. Scene work. The process of acting will be studied from in-class work and observation of Drama Program productions. Course geared to the student with little or no experience in acting. One course. *Froeber, Hemphill, Morris, Schilling, Storer, or West*

## OTHER UNDERGRADUATE COURSES

**102. Classical to Neoclassical. (AL)** Greek tragedy and comedy, Roman comedy, medieval and Renaissance drama, Restoration drama and drama of France's Golden Age. C-L: English 174A. One course. *Blackadder or Clum*

**103. Toward and Beyond Realism. (AL)** Development of British, European, and American drama and theater from the eighteenth century to the present. Key playwrights, genres, theories, and movements. C-L: English 174B. One course. *Blackadder or Clum*

**104. American Drama: O'Neill to the Present. (AL)** Representative plays by O'Neill, Odets, Miller, Williams, Albee, and leading contemporary playwrights. C-L: English 162. One course. *Clum*

**105. British Drama: Wilde to the Present. (AL)** Shaw, Pinter, Beckett, Stoppard, and others to the present. C-L: English 133. One course. *Blackadder or Clum*

**106. European Drama: Ibsen to the Present. (AL)** Ibsen, Strindberg, Chekhov, Pirandello, Beckett, and others to the present. One course. *Blackadder*

**107S. Twentieth-Century Women Playwrights. (AL)** Stein, Hellman, Terry, Wertenbaker, Egloff, Churchill, Fomes, and others. Not open to students who have taken Drama 125S. C-L: Women's Studies. One course. *McAuliffe*

**108S. The Comedies of Shakespeare.** (AL) See C-L: English 129A. One course. *Randall*

**109S. The Tragedies of Shakespeare.** (AL) See C-L: English 129B. One course. *Randall*

**111. The Musical.** (AL) History of the American musical theater from its origins to the present. Fundamentals of theater music and lyrics. Close study of representative works by Kern, Porter, Gershwin, Rodgers, and Sondheim. C-L: Music 164. One course. *Clum*

**112. Contemporary International Theater.** (AL) Developments in world theater since 1960. One course. *Blackadder*

**117S. Theater in London: Text.** (AL) (London summer program.) Not open to students who have taken the former Drama 149S. See C-L: English 176B. One course. *Clum*

**118S. Special Topics in Dramatic Literature, History, Theory, or Criticism.** (AL) May be repeated for credit. One course. *Staff*

**121S. Dramatic Writing.** (AL) Fundamentals of writing for stage and screen. Open to sophomores, juniors, and seniors; recommended for, but not limited to, students who have taken English 100B. Not open to students who have taken the former Drama 111S. Prerequisites: a practical theater course (for example, acting, directing, design, stagecraft) and consent of instructor. C-L: English 107S and Film and Video. One course. *Clum or Wilson*

**122S. Advanced Dramatic Writing.** (AL) Advanced projects in writing for production. Not open to students who have taken the former Drama 112S. Prerequisites: Drama 121S and consent of instructor. C-L: English 108S and Film and Video. One course. *Wilson*

**123S. Screenwriting.** (AL) Advanced writing projects for feature film. Study of existing scripts and videos, application of techniques. Consent of instructor required. Not open to students who have taken Drama 113S. C-L: English 102S and Film and Video. One course. *Wilson*

**131S. Acting.** (AL) Text analysis from the actor's point of view, preparation, emotional technique, voice, and movement. Scene work with focus on modern and contemporary texts. Not open to students who have taken the former Drama 101S. Consent of instructor required. One course. *Storer and staff*

**132S. Advanced Acting: Classical Texts.** (AL) Scansion, breath work, text analysis, arch, emphasis, the heroic character, style, period movement, and theatricality of choices which illuminate language. Selected texts from Shakespeare and seventeenth-century playwrights. Scene work. Not open to students who have taken the former Drama 102S. Prerequisites: Drama 131S and consent of instructor. One course. *Staff*

**133S. Advanced Acting: Contemporary Texts.** (AL) Scene study. Examination and development of performance choices. Studies based on reading and practice of chosen contemporary texts. Use of the script as the primary source for actor's choices. Not open to students who have taken the former Drama 103S. Prerequisites: Drama 131S and consent of instructor. One course. *Storer*

**136S. Voice and Speech.** (AL) Vocal production and articulation. Phonetics, control, emotional response, projection, placement, and awareness of regionalisms. Not open to students who have taken the former Drama 105S. Prerequisites: Drama 131S and consent of instructor. One course. *Morris*

**138S. Theater in London: Performance.** (AL) (London summer program.) Not open to students who have taken the former Drama 148S. See C-L: English 176C. One course. *Clum*

**140S. Directing.** (AL) Establishment of basic skills of information communication from script to stage to audience; analyzing texts from a director's point of view; basic stage articulation



of viewpoint; development of skills in mechanics and staging techniques. Emphasis on scripts of poetic realists. Not open to students who have taken the former Drama 181S. Prerequisites: Drama 99S or 131S and consent of instructor. C-L: Film and Video. One course. *McAuliffe or Storer*

**141. Production and Internship.** Project work that may begin in the freshman year and extend through graduation, including practical involvement in four different areas of Drama Program productions. Offered only on the pass/fail basis. Prerequisite: Drama 93. *Staff*

**142S. Film and Video Theory and Practice. (AL)** Prerequisite: Drama 173, English 101A, Literature 110, or Literature 114. See C-L: Film and Video 100S; also C-L: English 183S. One course. *Burns*

**151S. Directors/Actors Workshop. (AL)** Examination of rehearsal working methods and development of performance choices with emphasis on modern and contemporary scripts. Not open to students who have taken Drama 182S. Prerequisites: Drama 131S or 140S and consent of instructor. One course. *McAuliffe*

**152A. Musical Theater Workshop: Writing. (AL)** The writing of book, lyrics, and music for short original musicals. Culminates in a performance of the works created by the class. Prerequisite: Music 55 or playwriting. One course. *Clum*

**152B. Musical Theater Workshop: Performance. (AL)** Work on singing musical theater songs, movement, comedy techniques. Culminates in a performance of musicals written by the students in Drama 152A. Prerequisite: Drama 99S. One course. *Clum*

**159S. Special Topics in Theatrical Collaboration. (AL)** May be repeated for credit. One course. *Staff*

**161S. Design for the Theater. (AL)** Basic design principles and techniques for the three primary stage design areas: scenery, costumes, and lighting, with an introduction to sound design. Aesthetic and analytical skills, design appreciation, drafting ground plans, light plots, model building, and costume rendering. Laboratory requirement. Not open to students who have taken the former Drama 169S. Prerequisite: Drama 93 or consent of instructor. C-L: Dance 169S. One course. *Catotti and Ma*

**163S. Producing in America. (AL)** The history and organization of profit and nonprofit theater in America. Methods and techniques for establishing and maintaining theater organizations. Practical application in connection with Drama Program productions. Not open to students who have taken Drama 185S. One course. *Voss*

**167. Asian Art and Theater. (AL)** The social, philosophic, and artistic content of Asian visual arts and their relationship to theater from historical and practical points of view. C-L: Asian and African Languages and Literature 167. One course. *Ma*

**170. Drama of Greece and Rome. (AL)** See C-L: Classical Studies 106. One course. *Burian or Clay*

**171. French Drama of the Seventeenth Century. (AL, FL)** See C-L: French 148; also C-L: Medieval and Renaissance Studies. One course. *Longino*

**172. French Drama of the Twentieth Century. (AL, FL)** See C-L: French 162. One course. *Tufts*

**173. Introduction to Film. (AL)** Not open to students who have taken Drama 132. See C-L: English 101A; also C-L: Film and Video 130, and Literature 110. One course. *Gaines, Radway, Surin, Tompkins, Torgovnick, or Willis*

**174. Studies in Film History. (AL)** See C-L: English 185; also C-L: Film and Video, and Literature 116. One course. *Clum, Gaines, or Jameson*

**175S. The Italian Theater. (AL, FL)** Taught in Italian. See C-L: Italian 151S. One course. *Finucci*

**177S. Chekhov. (AL)** Not open to students who have taken Drama 157S/Russian 174S (Chekhov). See C-L: Russian 177S; also C-L: Comparative Area Studies. One course. *Flath and staff*

**178S. Special Topics in Film. (AL)** Not open to students who have taken the former Drama 197S. Prerequisite: Drama 173 or English 101A. See C-L: English 189S; also C-L: Film and Video. One course. *Clum, Gaines, or Moses*

**179. The History of Performance Art. (AL)** See C-L: Art History 179; also C-L: Comparative Area Studies, and Women's Studies. One course. *Stiles*

**182, 183. Shakespeare. (AL)** Not open to students who have taken Drama 115, 116. See C-L: English 143, 144; also C-L: Medieval and Renaissance Studies. One course each. *DeNeef, Goldberg, Gopen, Jones, Porter, Randall, or Shannon*

**185S. Introduction to German Drama. (AL, FL)** Taught in German. Prerequisite: four semesters college-level German, or equivalent. See C-L: German 133S. One course. *Risho'im or Walther*

**189S. Senior Seminar: The Theater Today. (AL)** Team-taught course on the current state of American drama and theater and its relation to American society. Theater as a vocation and avocation. Guest speakers and presentations. Open only to seniors. One course. *Riddell*

**191, 192, 193, 194. Independent Study.** Individual intensive research or creative projects. Half or one course. Consent of instructor required. Variable credit. *Staff*

**195, 196. Special Topics.** Illustrative examples: specific writers or other theater artists, media studies, styles, mime, masks, clowns, stage fighting, newspaper criticism, studies of the profession, audition techniques, and theater periods. May be taken more than once. Half course, one course, respectively. *Staff*

**195S, 196S. Special Topics.** Seminar versions of Drama 195 and 196. May be taken more than once. Half course, one course, respectively. *Staff*

**197-198. Senior Distinction Project. (AL)** One course, half course, respectively. Consent of instructor required. Variable credit. *Staff*

**220S. German Theater as Anti-Drama. (AL, FL)** Taught in German. See C-L: German 233S. One course. *Walther*

## COURSES CURRENTLY UNSCHEDULED

**176. Melodrama and Soap Opera. (AL)**

**225. Renaissance Drama: 1500 to 1642. (AL)**

## THE MAJOR

The major in drama offers students a grounding in (1) the history of theater and dramatic literature, and (2) the interrelated disciplines of the art of theater, for example, acting, design, directing, playwriting, and technical production. Students completing the major will be prepared for either graduate study, advanced theater training, or entry-level work in the profession.

*Major Requirements.* Ten courses, including Drama 93, 102, 103, 121S, 131S, 140S, 161S, 189S, and two additional 100-level courses in dramatic literature, history, theory, or criticism.

## Graduation with Distinction

Students pursuing graduation with distinction in drama must have a B average in drama courses to be eligible. They should contact the director of undergraduate studies during the semester prior to their last two semesters to propose a project pursuing a subject in-depth and name a project supervisor (a full-time faculty member in the area in which the student will pursue the project). This project may be an extended research paper in dramatic literature, theory, criticism, or theater history; a play in playwriting; a performance and production book in acting; a production and production book in directing. The director of undergraduate studies and the proposed project supervisor will consider the project for approval. The director of undergraduate studies will contact the program director for approval when the project will culminate in a production. After receiving approval from the director of undergraduate studies and the supervisor, the student will register for Drama 197 (one course) with the supervisor during the first semester of the final year and Drama 198 (one half course weekly tutorial with the supervisor) during the final semester. The project will be evaluated by the supervisor and the director of undergraduate studies. Three levels of distinction in drama will be recognized: "Highest Distinction," "High Distinction," and "Distinction."

## THE MINOR

Drama 91, 102, 103 and two courses in production (93, 121-163).

## Ecology

For courses in ecology, see Biology, Environment (Nicholas School), and Environmental Sciences and Policy Program.

## Earth and Ocean Sciences (GEO)

Professor Karson, *Chair*; Professor Haff, *Director of Undergraduate Studies*; Professors Baker, Barber, Corliss, Heron, Kay, Livingstone, Perkins, Pilkey, and Schlesinger; Associate Professors Boudreau, Clark, Klein, Malin, and Rojstaczer; Assistant Professors Lozier and Murray

A major or a minor is available in this division.

The Division of Earth and Ocean Sciences offers introductory and advanced courses in coastal geology, environmental geology, hydrology, geochemistry, geomorphology, geophysics, oceanography, paleontology, petrology, sedimentology, and marine geology. A Bachelor of Science degree is offered for those students wishing to pursue further studies in the earth and ocean sciences, and for those who intend to work professionally in environmental sciences. A Bachelor of Arts degree is offered for those students who do not intend to pursue the earth sciences professionally, but wish to understand more fully local and global environmental issues. Additional information about the division can be found on the divisional website (<http://www.geo.duke.edu>).

**10S. Analysis of Outcrops.** (NS) Field interpretation of geologic features. Includes four field trips. Prerequisite: Geology 41 (may be taken concurrently). Half course. *Boudreau or Karson*

**41. The Dynamic Earth.** (NS) Dynamic systems studied include volcanoes, earthquakes, sea-floor spreading, plate tectonics; surficial processes such as floods, glaciers, landslides, and related phenomena; and the composition of the earth including rocks and minerals. One course. *Klein, Murray, or Perkins*

**43S. Application of Geologic Principles.** (NS) Mineral and rock classification, topographic and geologic map interpretation. Prerequisite: Geology 41 (may be taken concurrently). Half course. *Staff*

**45. Global Land, Air, and Water Resources. (NS)** An overview of the physical geography of the global environment with a focus on the atmosphere, water resources, and soils. One course. *Rojstaczer*

**47S. Natural and Human-Induced Environmental Change. (NS)** A comparative examination of the effects of natural and human influences on earth-surface environments. One course. *Staff*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**53. Introductory Oceanography. (NS)** Basic principles of physical, chemical, biological, and geological oceanography. Fee for required field trip to the Marine Laboratory. C-L: Biology 53. One course. *Corliss, Lozier, Pilkey, and Searles (biology)*

**90S. Fossils and Climate Change. (NS)** Study of the use of animal and plant fossils including geochemical analyses of the fossils to understand past climates; review of invertebrate fossils in the laboratory. Climatic changes in both terrestrial and oceanic environments over time scales ranging from millions to hundreds of years. A three-day field trip to include fossil collecting on the North Carolina coastal plain and studying modern coastal environments and living invertebrates at the Duke University Marine Laboratory. Open only to students in the FOCUS Program. One course. *Corliss*

**105L. Earth Materials. (NS)** An introduction to minerals, rocks, and soils. Their genesis, identification, and classification. Includes laboratory. Prerequisite: Chemistry 12L (may be taken concurrently) or consent of instructor. One course. *Boudreau or Klein*

**106L. Igneous and Metamorphic Rocks. (NS)** Silicate mineralogy, theory of origin and classification of igneous and metamorphic rocks, and rock identification. Lectures and laboratory. Prerequisite: Geology 105L. One course. *Boudreau*

**110L. Stratigraphic Principles and Practice. (NS)** Discrimination and interpretation of vertical and lateral stratigraphic sequences utilizing both physical and biological attributes of stratigraphic units. Practical exercises include measuring and describing outcrop and subsurface sequences, mapping techniques in stratigraphic analysis, seismic stratigraphy, and environmental reconstruction. Prerequisites: Geology 41 and 105L. One course. *Perkins*

**112. Tropical Marine Geology. (NS)** Overview of interaction between marine organisms, sediment production and alteration, depositional processes, and environments of deposition. Application of modern analogs to interpreting the Pleistocene rock record of South Florida and the Caribbean. Prerequisite: Geology 41 or Biology 25L, or consent of instructor. One course. *Perkins*

**115. Introductory Applied Coastal Geology. (NS)** Oceanographic and geologic processes responsible for the evolution of beaches and barrier islands. Various solutions to the global retreat of shorelines. One course. *Murray and Pilkey*

**116. The Beach and the Surf Zone. (NS)** Fluid motions of many time scales in the nearshore environment, including waves and currents. How fluid motions interact with the shape of the beach and bed in the surf zone, giving rise to features such as beach cusps, bars, and channels. Consent of instructor required. One course. *Murray*

**117S. Field Mapping. (NS)** An introduction to the techniques used to produce a geologic map. Weekend field trips to map locations of interest. Prerequisite: Geology 41. Half course. *Boudreau or Karson*

**120. Environmental Geology. (NS)** A case history approach to the role of geological materials and processes in environmental assessment studies. The impact of rock type, faulting, folding, weathering, erosion, flooding, and underground fluid flow on the human



environment. Cases taken from current and past geological studies of environmentally sensitive sites. One course. *Malin*

**121S. The Surface of the Earth. (NS)** Effects on the earth's surface of wind, water, ice, weathering, volcanism, tectonics, and human activity. Origin and nature of landforms. Prerequisite: Geology 41. One course. *Haff*

**123. Hydrology. (NS)** An overview of the hydrologic cycle and its impact on global climate and local environmental problems. Prerequisites: Mathematics 32 and Chemistry 12L or consent of instructor. One course. *Rojstaczer*

**126S. Field Methods in Earth and Environmental Sciences. (NS)** Introduction to basic field methods used in the earth and environmental sciences. Field investigations focus on topics such as groundwater and surface water movements, soil chemistry and identification, topographic and geologic mapping, the atmosphere/soil interface, and plant identification and distributions. Through field studies employing various techniques, the student will learn how to design a field investigation, collect data to address a specific goal, and interpret and report the results. Visits to five local field sites. Open only to juniors and seniors. C-L: Environment 126S. One course. *Klein*

**130L. Principles of Earth Structure and Geophysics. (NS)** Interpretation of geological deformation features and the geophysical expression of environmentally important features including active and near-surface tectonics and deep earth structures and processes. Lectures and laboratory. Prerequisites: Geology 106L and 110L. One course. *Karson and Malin*

**145. Fossils and Their Applications. (NS)** Animal and plant fossils; laboratory review of invertebrate marine fossils important to paleoenvironmental interpretations. The paleoecology, functional morphology, and geochemistry of different fossil organisms related to paleoenvironmental and paleoceanographic reconstructions. Lecture, laboratory, and field trip. Not open to students who have taken Geology 90S. One course. *Corliss*

**151S. Global Change. (NS)** Analysis of the causes and geological record of climatic change; emphasis on the Holocene. One course. *Baker*

**152. Field Methods in Environmental Geophysics. (NS)** A practical field methods class emphasizing the use of geophysical profiling equipment to study near surface geology. Includes field exercises in seismic refraction/reflection profiling, gravity and magnetic profiling, and electrical methods. Basic geological and quantitative relations for interpreting the field measurements. One course. *Malin*

**160. Ocean and Atmosphere Dynamics. (NS)** Introduction to the dynamics of ocean and atmospheric circulations, with particular emphasis on the global climate cycle. Prerequisites: Mathematics 31 and 32, or consent of instructor. One course. *Lozier*

**172L. History of the Earth. (NS)** Evolution of the earth and organisms through time. Weekend field trip to the Appalachian Mountains. Lectures and laboratory. Not open to students who have taken Geology 72L. One course. *Corliss*

**181S. The American Southwest. (NS)** Geomorphic and geologic features of arid terrain, including volcanism, tectonics, soils and weathering, paleo-lakes, wind-blown sand and dust, landslides, and alluvial fans. Focus on the Mojave Desert region of California and Nevada. Includes week-long field trip. Prerequisites: Geology 41 and consent of instructor. One course. *Haff*

**182S. Rivers of the Carolinas. (NS)** The origin of rivers. Sediment and water transport by rivers. Droughts and floods and their relationship to global climate change. The role of rivers

in regional history and economic development. The importance of rivers and estuaries to modern society. The course includes three field trips (via canoe) to typical rivers of the coastal plain, piedmont, and Appalachian Mountains regions. One course. *Baker*

**183S. Hydrology and Geology of Yellowstone National Park. (NS)** Hydrology and geology of Yellowstone National Park and vicinity. Includes field trip to Yellowstone National Park to examine volcanic and hydrothermal features of the region. Consent of instructor required. Prerequisites: Geology 41 and 123. One course. *Rojstaczer*

**185S. The Pacific Northwest. (NS)** Geology and geomorphology of the Pacific Northwest, including volcanism, tsunamis, channeled scabland, Columbia River, Cascade Mountains, glaciers, and coastal features. Includes week-long field trip to Washington or Oregon. Prerequisites: Geology 41 and consent of instructor. One course. *Murray and Pilkey*

**191, 192. Independent Study.** Directed reading or research. Open only to qualified juniors and seniors by consent of director of undergraduate studies and supervising instructor. One course each. *Staff*

**195. Independent Study for Nonmajors.** Open to qualified juniors and seniors upon approval of the departmental faculty. One course. *Staff*

### **For Advanced Undergraduates and Graduates**

**200. Beach and Coastal Processes. (NS)** The study of sedimentary processes and geomorphology of nearshore environments with emphasis on both developed and undeveloped barrier island systems. One course. *Pilkey*

**202. Beach and Island Geological Processes. (NS)** Processes affecting evolution of beaches and barrier islands with emphasis on the interaction of such processes with the trappings of man. Not open to students who have taken Geology 196. Consent of instructor required. (Given at Beaufort on two weekends.) C-L: Marine Sciences. Half course. *Pilkey*

**203. Physical Oceanography. (NS)** Introduction to the dynamic principles of ocean circulation with an emphasis on large temporal and spatial scales of motion. Topics include wind-driven and density-driven flow, western boundary intensification, mid-ocean, shelf, and tropical circulations. Prerequisites: Mathematics 31 and 32 or consent of instructor. C-L: Environment 290 and Mechanical Engineering 290. One course. *Lozier*

**204. Nearshore Processes and Geomorphology. (NS)** Phenomena resulting from waves, wave momentum (radiation stress), and wave interactions. Includes oscillatory flow, long period (infragravity) motions, and mean currents. Nearshore sediment transport and possible origins of beach and nearshore topographic features. Consent of instructor required. One course. *Murray*

**205. Geological Oceanography. (NS)** The geology of ocean basins, including origin, bottom physiography, sediment distribution, and sedimentary processes. Not open to students who have taken Geology 206S. (Given at Beaufort.) C-L: Environment 291 and Marine Sciences. One course. *Staff*

**206S. Principles of Geological Oceanography. (NS)** Geological aspects of the ocean basins including coastal to deep water sediment types and sedimentation processes, sea floor physiography, and environmental problems. Not open to students who have taken Geology 205. Consent of instructor required. One course. *Baker*

**207S. Analysis of Coastal Engineering Models. (NS)** A critical evaluation of the assumptions and principles underlying coastal engineering mathematical models used to predict the behavior of beaches. Involves classroom discussion of both the geology and engineering modeling literature. Consent of instructor required. One course. *Pilkey*

**208S. Paleoceanography.** (NS) Geology, paleoceanography, and evolution of the oceans, ocean basins, and marine biota based on analysis of deep-sea sedimentary sequences. One course. *Corliss*

**209S. Climate Dynamics and the Paleoclimatic Record.** (NS) Introductory readings and reviews of modern physical climatology followed by extensive readings covering the record of past climatic change, concentrating on latest Quaternary and Holocene time. Topics include the global energy balance, the hydrologic cycle, general circulation of the atmosphere and oceans, climate modeling, future climate change, and the known record of paleoclimate (from marine and lake sediments, corals, soils, ice cores, etc.). Some background in physical sciences recommended. One course. *Baker*

**219S. Erosion.** (NS) Empirical and process-based approaches to description and prediction of sediment transport and erosion. Includes study of USLE, landscape evolution models, overland flow, gully formation, debris flows, landsliding, bedload and suspended load transport in rivers, and aeolian transport. Principles illustrated through case studies. Prerequisite: Geology 41 or consent of instructor. One course. *Haff*

**220S. Regional Geomorphology of the United States.** (NS) Origin, nature, and significance of natural features of the earth's surface, with focus on regional studies within the United States. Four main geographical areas emphasized each year from among Great Plains, Rocky Mountains, Colorado Plateau, Basin and Range, Columbia and Snake River Plains, Pacific Coast and Mountain System, Interior Mountains and Plateaus, Appalachian Mountains and Plateaus, Atlantic and Gulf Coastal Province. Prerequisites: open to graduates and advanced undergraduates with consent of instructor. One course. *Haff*

**221. Hydrogeology.** (NS) Theory of groundwater flow and solute transport with application to geologic processes, water resources, and water quality. Prerequisites: Chemistry 12L, Mathematics 103, and Physics 42L or consent of instructor. One course. *Rojstaczer*

**222. New Perspectives and Methods in the Earth Sciences.** (NS) Nonlinear dynamics and related approaches to understanding, modeling, and analyzing physical systems, with emphasis on applications in the earth sciences. Consent of instructor required. One course. *Murray*

**223. Computational Methods in the Hydrologic Sciences.** (NS) Solution techniques for partial differential equations commonly used to describe hydrological processes. Methods of analysis of spatial and temporal hydrologic data. Prerequisite: knowledge of computer language, introductory statistics, math through partial differential equations. One course. *Rojstaczer*

**230S. Advanced Structural Geology.** (NS) Stress and strain emphasizing geometric, kinematic, and dynamic analysis of micro structures and mesoscopic structures. Prerequisite: Geology 130L or consent of instructor. One course. *Karson*

**233S. Oceanic Crust and Ophiolites.** (NS) Structure, tectonics, petrology, and geochemistry of oceanic spreading environments and ophiolite complexes. Prerequisites: Geology 106L and 130L or consent of instructor. One course. *Karson*

**236S. Lithosphere Plate Boundaries.** (NS) Plate tectonics and the geological and geophysical expression of orogenic belts, spreading centers, transform faults, subduction zones. Prerequisite: Geology 130L or consent of instructor. One course. *Karson*

**239S. Advanced Topics in Structural Geology and Tectonics.** (NS) Selected topics related to deformation of rocks ranging from microstructure to plate tectonics. Prerequisite: Geology 130L or consent of instructor. One course. *Karson*



**250. Applied Mathematics for the Environmental and Earth Sciences. (QR)** Overview of quantitative methods used in modeling and data analysis of environmental and geologic problems. One course. *Staff*

**252. Geophysics and Crustal Dynamics. (NS)** A quantitative survey of the earth's seismology, gravity, magnetism, heat flow, and internal dynamics. Derivation of the basic equations of geophysics and geodynamics. The locations and mechanics of earthquakes; seismotectonics and crustal dynamics, the earth's internal layers, the gravitational attraction of mountains, the magnetic properties of rocks, the cooling of the earth, and the basics of continental drift. Original research project required. Prerequisites: upper division or first-year graduate standing in science or engineering. One course. *Malin*

**269. Thermodynamics of Geological Systems. (NS)** Introductory thermodynamics applied to geologic problems through understanding of phase equilibrium. Prerequisites: Geology 105L (may be concurrent) and Mathematics 32. One course. *Boudreau*

**270. Sedimentary Geochemistry. (NS)** Chemistry of aqueous solutions and authigenic minerals in sedimentary systems. Prerequisites: Chemistry 12L and Mathematics 32. One course. *Baker*

**271. Isotope Geochemistry. (NS)** Theory and applications of stable and radioactive isotope distributions in nature. Prerequisites: Chemistry 12L and Mathematics 32. One course. *Baker*

**272. Biogeochemistry. (NS)** Processes controlling the circulation of carbon and biochemical elements in natural ecosystems and at the global level, with emphasis on soil and surficial processes. Prerequisite: Chemistry 12L or equivalent. C-L: Biology 272. One course. *Schlesinger*

**273S. Analytic Techniques. (NS)** An introduction to advanced analytic procedures used in the earth sciences: such as electron microbeam techniques (scanning electron microscopy, electron microprobe analysis) and plasma emission/absorption spectroscopy. Consent of instructor required. One course. *Boudreau and Klein*

**285S. Layered Intrusions. (NS)** Survey of layered igneous intrusions and current theories on crystallization and other processes in mafic magmas. Offered alternate years. Prerequisites: Geology 105L and 106L or consent of instructor. One course. *Boudreau*

**295S. Advanced Topics in Geology. (NS)** Topics, instructors, and credits to be arranged each semester. Variable credit. *Staff*

## **COURSES CURRENTLY UNSCHEDULED**

**122. Models in Environmental Science. (NS)**

**237S. Structure and Evolution of the Appalachian Orogen. (NS)**

## **THE MAJOR**

The Division of Earth and Ocean Sciences offers one A.B. option and four B.S. tracks for a major in the division.

### **For the A.B. Degree**

The A.B. degree in earth and ocean sciences is designed as a flexible major for those students interested in how the earth, atmosphere and oceans work. The major is intended to provide a general knowledge of scientific issues that shape and control the environment in which we live. It is not intended for students who plan to pursue advanced education in the earth and ocean sciences, or to become professional geologists or environmental scientists.

*Major Requirements.* Required courses include Geology 41, plus any six geology courses, of which four must be 100-level or higher, plus four additional 100-level or higher courses in



either geology or related fields (PHY, MTH, CHM, BIO, ME, CE, EE, CPS, BAA, ENV), as approved by the director of undergraduate studies.

#### **For the B.S. Degree**

*Prerequisites.* Geology 41, 43S (half-course), and 53; Chemistry 11L and 12L; Mathematics 31 and 32; either Physics 41L and 42L (or Physics 51L and 52L, or Physics 53L and 54L) or Biology 25L (for the biological oceanography option only).

**The Division of Earth and Ocean Sciences offers four programs leading to a B.S. degree:**

#### **Geology: Preparatory to Advanced Studies in Geology**

The B.S. degree in geology provides a strong background for subsequent graduate work for those who wish to follow an academic or professional career track in any branch of the earth and ocean sciences.

*Major requirements.* Required courses include Geology 105L, 106L, 110L, 130L, 172L, Statistics 110 or 112, and two elective 100-level geology courses or approved substitutions.

Although not specifically required, students interested in advanced studies in geochemistry, hydrogeology, petrology or structural geology should consider taking additional courses in mathematics (ordinary differential equations, algebra), computer programming and physical chemistry. Students interested in advanced studies in geophysics should consider taking additional courses in geophysics, as well as in classical mechanics, electricity and magnetism, mathematics and mathematical physics. Students interested in advanced studies in paleontology should consider taking additional elective geology courses in paleontology, as well as courses in anatomy, biology, botany and ecology.

#### **Geology: Preparatory to Advanced Studies in Geological Oceanography**

The B.S. track in geological oceanography is designed for those who wish to pursue advanced studies in geological oceanography.

*Major requirements.* Geology 160, 172L, Statistics 110 or 112, and three from the following list: Geology 105L, 110L, 112L, 203, 206, Biology 114, Biology 129L, plus two elective 100-level geology courses or approved substitutions.

Although not specifically required, students interested in advanced studies in geological oceanography should consider taking additional courses in mathematics (ordinary differential equations, linear algebra), computer programming, organic and physical chemistry.

#### **Geology: Preparatory to Advanced Studies in Biological Oceanography**

The B. S. track in biological oceanography is designed for those who wish to pursue advanced studies in biological oceanography.

*Major requirements.* Geology 160, 172L, Statistics 110 or 112, and three from the following list: Geology 112, 203, 206, 208, Biology 110, Biology 114, Biology 123, Biology 129L, Biology 150, plus two elective 100-level geology courses or approved substitutions.

Although not specifically required, students interested in biological oceanography should consider taking additional post-introductory courses in biology, botany and ecology.

#### **Geology: Preparatory to Advanced Studies in the Environmental Earth Sciences**

*Major requirements.* Geology 121S, 123, 160, 172L, Statistics 110 or 112, plus three 100-level geology courses or approved substitutions.

Interested students may work with departmental faculty members to plan a specialized course sequence in a variety of areas relating to environmental earth sciences. Areas of specialization include coastal studies, global change, hydrology, geomorphology, and environmental geology. Courses in these areas can be combined with related courses in departments such as Civil and Environmental Engineering, Zoology, Botany and the School

of the Environment to create an educational experience tailored to individual student interests.

Although not specifically required, students interested in advanced studies in environmental earth sciences should consider taking additional courses in mathematics (ordinary differential equations, linear algebra), computer programming and chemistry. Students who are interested in field research are strongly urged to take a semester at the Beaufort Marine Lab or to attend a geology summer field camp. Geology summer field camps usually require Geology 106, 110, and 130 as prerequisites.

Approved elective course substitutions for the B.S. degree: Mathematics 103, 104, 111, 114, Chemistry 151, 161, Computer Science 50, Physics 181, 182, 230, 231. Others with approval of the Division of Earth and Ocean Sciences faculty and the director of undergraduate studies.

### **Graduation with Distinction**

The Division of Earth and Ocean Sciences through Trinity College offers graduation with distinction through successful completion of a student research project. A candidate for graduation with distinction in the earth and ocean sciences must have a divisional grade point average of 3.1 at the beginning of the project to qualify for nomination. The student will apply for consideration for graduation with distinction by the end of his or her junior academic year by writing a letter of intent to the director of undergraduate studies describing the project. The student must solicit a committee of three faculty members who will review the student's record and decide to admit or reject the application and oversee the project. The student will normally do the work as part of an independent study course (Geology 191, 192). The project will consist of an original piece of scientific research which will be summarized by a written report in the style of a scientific publication. The student will also make an oral presentation to students and faculty of the division before the end of classes of the student's final semester. The decision on granting graduation with distinction will be made by a vote of the student's project committee, with a majority in favor needed for graduation with distinction. Graduation with distinction may be awarded in three levels: distinction, high distinction, and highest distinction. The decision on level of distinction will be made by majority vote of the student's project committee.

### **THE MINOR**

The Division of Earth and Ocean Sciences offers an option for a minor in geology.

*Minor Requirements.* Geology 41, plus any four additional geology courses, of which three must be 100-level or higher.

### **TEACHER CERTIFICATION**

A geology major who is interested in teaching in secondary schools is encouraged to earn a comprehensive science teaching certificate in addition to the bachelor's degree. The teaching certificate, which is earned by fulfilling requirements prescribed by the state of North Carolina, is generally accepted in most of the fifty states by reciprocal agreement. In addition to completion of any of the geology major tracks as described above (the A.B. option is particularly suited for those interested in a teaching certificate), the requirements for the comprehensive science teaching certificate include coursework in biology, chemistry, physics, an appropriate course in psychology, and several courses in education. The last semester of the senior year is devoted to the student-teaching block, including two special, accelerated courses and ten weeks of full-time teaching and observation in the schools, working with a certified teacher and with Duke faculty. Anyone considering secondary school teaching should contact the Program in Education as soon as possible.

## Economics (ECO)

Professor McElroy, *Chair*; Professor De Marchi, *Director of Undergraduate Studies*; Professors Clotfelter, Cook, Goodwin, Grabowski, Graham, Kelley, Kimbrough, Ladd, Moulin, Sloan, Smith, Tauchen, Tower, Trembl, Vernon, Weintraub, and Yohe; Associate Professors Conrad, Kramer, Mendoza, and Zhou; Assistant Professors An, Connolly, Coppejans, Crawford, Hamilton, Peretto, Sieg, and Yang; Professors Emeriti Blackburn, Davies, Kreps, and Wallace; Research Professors Burmeister and Toniolo; Adjunct Professor Gallant; Adjunct Associate Professor Zarkin

A major or minor is available in this department.

Economics courses develop the critical and analytical skills essential for understanding economics and institutions, in both their contemporary and historical settings. Although no particular vocational or professional goal is emphasized, these courses provide the academic background necessary for positions in industry, for work in many branches of government service, for law school, and for graduate study in business administration, economics, and the social sciences.

Students planning to do graduate work in economics are advised to take as many of the following courses in mathematics (listed in preferential order) as their schedules permit: Mathematics 31, 32, 103, 104, 131, 135, and 136.

**1A. Introductory Macroeconomics.** Credit for Advanced Placement on the basis of a score of 4 or 5 on the Advanced Placement Macroeconomics examination. One course.

**1D. National Income and Public Policy. (SS)** Basic economic analysis emphasizing current public policy issues. Means of determining the level and rate of growth of aggregate national income and output. Causes of unemployment, inflation, and international payment problems. The effects of monetary policy (money supply and interest rates) and fiscal policy (government expenditures and taxes) on these problems. For freshmen; upperclassmen by consent of instructor. One course. *Staff*

**1S. National Income and Public Policy. (SS)** Seminar version of Economics 1D. Open only to freshmen. One course. *Kelley*

**2A. Introductory Microeconomics.** Credit for Advanced Placement on the basis of a score of 4 or 5 on the Advanced Placement Microeconomics examination. One course.

**2D. Competition, Monopoly, and Welfare. (SS)** The composition of output and the distribution of income in a market economy. Role of government. Contemporary problems. Topics such as environmental economics, monopoly, unionism, international trade. Comparison of a market economy with other systems of economic organization. Economic problems of developing countries. Open only to freshmen. C-L: Health Policy. One course. *Crawford*

**2S. Competition, Monopoly, and Welfare. (SS)** Seminar version of Economics 2D. Open only to freshmen. Consent of instructor required. One course. *Weintraub*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**51D. National Income and Public Policy. (SS)** For description see Economics 1D. Open to all students. May be taken before or after Economics 2D or 52D. One course. *De Marchi and Goodwin*

**52D. Competition, Monopoly, and Welfare. (SS)** For description see Economics 2D. Open to all students. May be taken before or after Economics 1D or 51D. C-L: Health Policy. One course. *Staff*



**53. Economics of Contemporary Issues. (SS)** Modern economic problems, such as environmental deterioration and urban decay. The market as one of the interrelated subsystems of the social system, from institutionalist, Marxist, and other perspectives in the social sciences. One course. *Staff*

**60. Economics of a United Europe. (SS)** Implications of a common monetary policy, common welfare standards, unemployment, and migration in the European Union. (Taught only in the Duke-in-Berlin Program.) C-L: Comparative Area Studies. One course. *Tolksdorf*

**66. International Economics. (SS)** Global trade, trade restrictions, monetary systems, exchange rates, and economic development. Applications to the European Union, the United States, and the developing world. (Taught only in the Duke-in-Madrid Program.) Prerequisite: Economics 1 or 51 or 2 or 52. One course. *Allard*

**67. Comparative Economic Systems. (SS)** Economic institutions in modern industrial economies and the third world. Managing and evaluating an economic system. Ideologies and approaches to the use of market and economic planning in the former Soviet Union and Yugoslavia, the United States, and the European Union. (Taught only in the Duke-in-Madrid Program.) Current issues. One course. *Allard*

**83. Financial Accounting and Decision Making. (SS)** The accounting model of the firm, transaction analysis, the use of accounting information by management. Topics include procedures to process accounting data, income determination, financial statement analysis, cost behavior, budgeting, and short-run decisions. Not open to students who have taken Management Sciences 53. Does not count for economics major or minor requirements. One course. *Staff*

**98. Introduction to Canada. (SS)** Does not count for economics major or minor requirements. See C-L: Canadian Studies 98; also C-L: Comparative Area Studies, History 98, Political Science 98, and Sociology 98. One course. *Staff*

**115. Introduction to North America. (CZ, SS)** Does not count toward the economics major or minor requirements. See C-L: North American Studies 110; also C-L: Cultural Anthropology 129, History 108F, Latin American Studies, Political Science 119, Public Policy Studies 115, Romance Studies 125, and Sociology 109. One course. *Thompson*

**130. The Changing Role of the Market in the Social System. (SS)** Comparison of the different perspectives on the role of the market in the social system, from libertarian to Marxian. Application of the tools of analysis of market behavior to seemingly noneconomic problems such as crime and environmental decay. Prerequisites: Economics 1 or 51, and 2 or 52. One course. *Staff*

**132. Introduction to Economic History. (CZ, SS)** A survey of Western economic history: population, production, exchange, and institutions; from antiquity to the present. Prerequisite: Economics 2 or 52. One course. *Staff*

**134. Japanese Economy and Its History. (SS)** Japanese economic development since the end of isolation, in the mid-nineteenth century. Prerequisite: one course in economics or Far Eastern history. C-L: Comparative Area Studies. One course. *Staff*

**136. The International Economy Since 1800. (CZ, SS)** The history of the international monetary systems, the economic causes and effects of wars, the evolution of super-national economic institutions. Prerequisite: Economics 1D or 51D; recommended: Economics 154. One course. *Toniolo*

**139. Introduction to Econometrics. (QR)** Data collection, estimation, and hypothesis testing. Use of econometric models for analysis and policy. Prerequisites: Economics 2 or 52, Mathematics 32 or equivalent, and statistics. One course. *Sieg, Tauchen, or Wallace*



**140. Comparative Economic Systems. (SS)** A strategic analysis of the new economics of Russia, China, and Eastern Europe as well as the socioeconomic, political systems of the United States, Japan, Sweden, and other capitalistic countries. Prerequisites: Economics 1 or 51, and 2 or 52. C-L: Comparative Area Studies. One course. *Trembl*

**141. Applied Econometrics. (QR)** Covers basic econometric methods useful in empirical economic research and forecasting. Topics include multiple regression analysis under nonstandard conditions; probit, logit, and other limited dependent variables; count data; simultaneous equation systems; and basic models with panel data. Prerequisites: Economics 139, Mathematics 104, and Statistics 110B or equivalent. One course. *An*

**142S. Chinese Economy in Transition. (SS)** Evolution of the Chinese economy since 1949. Exposition of alternative economic systems, the commune, incentive problems, and state enterprises. Analysis of recent reforms and their effects on economic efficiency: agricultural growth, changes in ownership structures, financial markets, reforms and inflation, privatization, gradualism, and shock treatment. Through a research project students develop expertise in one aspect of the Chinese economy. Prerequisites: Economics 1 or 51, and 2 or 52. C-L: Comparative Area Studies and Public Policy Studies 142S. One course. *Yang*

**145. Soviet System and the Emerging Russian Economy. (SS)** Historical development and structure of command-administrative system. Gorbachev's perestroika. The transition from plan to market. One course. *Trembl*

**146. Adam Smith and the System of Natural Liberty. (SS)** The writings of Adam Smith, including close readings of *The Wealth of Nations* and *The Theory of Moral Sentiments*, and selections from Mandeville, Hutcheson, Hume, Quesnay, Turgot, and Bentham. Focus on eighteenth-century views on the nature of society and the origins of prosperity, the luxury debate, and links between natural philosophy (including medical thought), and moral philosophy. Not open to students who have taken Economics 151. C-L: Comparative Area Studies. One course. *De Marchi*

**148. History of Economic Thought. (SS)** Approaches to economic problems from Aristotle to Keynes, emphasizing certain models and doctrines—their origins, relevance, and evolution. Readings from Mun, Quesnay, Adam Smith, Malthus, Ricardo, Marx, Walras, Veblen, and Keynes. Not open to students who have taken the course as Economics 150. Prerequisites: Economics 1 or 51 and 2 or 52. C-L: Comparative Area Studies. One course. *De Marchi or Goodwin*

**149. Microeconomics. (SS)** Cost and supply considerations in price theory; the demand for factors of production. The allocation of resources in the context of competitive and monopolistic market structures. Not open to students who have had Public Policy Studies 110. Prerequisites: Economics 2 or 52, and Mathematics 26L or 31 or 31L. One course. *Graham, Trembl, Vernon, or Zhou*

**152. Mercantile Culture and Art in the Netherlands. (CZ)** See C-L: Art History 155. One course. *De Marchi and Van Miegroet*

**153. Money and Banking. (SS)** The evolution and operations of commercial and central banking and nonbanking financial institutions in the United States, the determination of monetary aggregates and interest rates, the financial impacts of Treasury operations, and the linkages from Federal Reserve actions to price level, employment, economic growth, and balance of payments objectives. Prerequisite: Economics 154. One course. *Yohe*

**154. Macroeconomics. (SS)** Concepts and measurement of national income and expenditures, employment, interest rates, and price levels; the theoretical determination of these aggregates; applications of macroeconomic theory to business cycles and economic

growth. Prerequisites: Economics 1 or 51, 2 or 52, and Mathematics 26L or 31 or 31L. One course. *Connolly, Kimbrough, Mendoza, or Yohe*

**154L. Macroeconomics.** (SS, QR) Same as Economics 154, except includes a weekly computer lab. Microsoft Excel used to estimate economic models using regression analysis and to simulate linearized economic models using matrix methods. Not open to students who have taken Economics 154. Prerequisites: Economics 1 or 51, 2 or 52, and Mathematics 26L or 31 or 31L. One course. *Tower*

**155S. Labor Economics: Analysis and Measurement.** (SS) Labor market equilibria. The demand for labor. The supply of labor: human fertility, human capital, hours of work, and labor force participation. Wage levels and differences. Union and government as labor market factors. Prerequisites: Economics 149, Mathematics 26L or 31 or 31L, and statistics. One course. *McElroy or Yang*

**156. Health Economics.** (SS) Economic aspects of the production, distribution, and organization of health care services, such as measuring output, structure of markets, demand for services, pricing of services, cost of care, financing, mechanisms, and their impact on the relevant markets. Prerequisite: Economics 149 or Public Policy Studies 110. C-L: Health Policy and Public Policy Studies 156. One course. *Sloan*

**157S. Business Cycles and Economic Forecasting.** (SS) Causes of fluctuations in economic activity and conventional methods of forecasting micro- and macroeconomic variables, using microcomputer programs. Forecasting projects by students. Prerequisites: Economics 149, 154, and Statistics 110B. One course. *Yohe*

**158. Financial Markets and Investments.** (SS) The tools learned in microeconomics, macroeconomics, basic mathematics, and statistics applied to problems in financial economics. A blend of pure economic theory, an investigation of financial data, and practical applications using personal computers. Prerequisites: Economics 149, Economics 154, and a statistics course—preferably Statistics 110B or 210B. One course. *Burmeister or Tauchen*

**161S. Economics of Slavery in the American South.** (SS) Examines how modern economic analysis is helpful in understanding the nature and development of a slave economy, society, and culture. Combines the study of economic development and comparative economic systems. Prerequisite: Economics 149. C-L: African and African-American Studies 161S. One course. *Staff*

**163. Economics of the Environment.** (SS) Role of economic methods in evaluating the use and abuse of environmental resources. Focus on characteristics of resources that influence efficient allocation decisions. Current case studies used to develop relevant microeconomics such as natural resource damage assessment, auctions for pollution permits, trade, and the environment. Prerequisite: Economics 52. One course. *Smith*

**164. Formulating Macroeconomic Concerns, 1936-86.** (SS) How social and political concerns, ideals of fairness, the availability of appropriate quantitative information, and modeling techniques shaped the way macroeconomic issues were perceived during this period, principally in the United States. Evolutionary case studies of selected issues—inflation/deflation, unemployment, the incentives-security complex, markets, and taxation, distribution, and growth—to understand the changing contexts within which models have been conceived and thought to be applicable. Prerequisite: (or corequisite) Economics 154. One course. *De Marchi*

**165. American International Economic Policy.** (SS) Topics include United States trade policies and protectionism, the North American Free Trade area, trade and economic relations with industrialized countries, policies toward developing countries and multilateral institutions, macroeconomic policy coordination, and relations with Europe. Prerequisites: Economics 1 or 51 and 2 or 52. C-L: Public Policy Studies 165. One course. *Staff*

**167. Multinational Management.** (SS) Economic, political, and legal variables which influence the form of organization. Multinational enterprise and foreign direct investment. Prerequisite: Economics 149. One course. *Staff*

**171S. Behavioral and Experimental Economics.** (SS) The relationship between actual behavior and economic models. Topics include individual decision-making behavior, game theory, and the role of market institutions. The interaction of economic and psychological theory. Students have the opportunity to participate in, and conduct, economic experiments. Prerequisite: Economics 149 or consent of instructor. One course. *Staff*

**173. Economics of Organization and Management.** (SS) Coordination and motivation issues within a corporation along with the internal design and dynamics of organizations. Topics include the structure of employment contracts, performance incentives, and the pricing of financial assets. Prerequisite: Economics 149. One course. *Staff*

**175. Economics of Modern Latin America.** (SS) The remarkable shift that has taken place in various countries of Latin America from a statist, import substitution model of development towards a more free-market economy. Emphasis on case studies of individual countries and specific policies including opening markets to foreign trade and investment, privatization, deregulation, creation of private pension systems, and building greater transparency in financial markets. The end of Latin American debt crises and prospects for hemispheric integration. Prerequisites: Economics 1 or 51 and 2 or 52; or consent of instructor. C-L: Comparative Area Studies and Latin American Studies. One course. *Staff*

**180. Law and Economics.** (SS) An introduction to the economic analysis of legal issues and legal reasoning. Case studies in accident law, product liability, and the value of life. Other topics include contracts, property, affirmative action, civil procedure, and the economics of criminal behavior. Prerequisite: Economics 149. One course. *Staff*

**181. Corporate Finance.** (SS) Major corporate decisions from the perspective of the firm with an emphasis on the interaction of the firm with financial markets: project evaluation for investment, choice between borrowing and issuing stock, dividend policy, organizational form (for example, mergers and acquisitions). Introduction to financial markets: issuing stocks, analyzing financial performance, and options. Prerequisites: Economics 1 or 51, 2 or 52; Economics 149 and some statistics recommended. One course. *Coppejans*

**183. Agency and Accounting.** (SS) The production and use of information in corporate decision making and financial markets. The theory of principals and agents. The relationship between the structure of information flows and incentives within the firm and the impact of that relationship on the firm's operations, organizational form, capital structure, and compensation scheme. How the dissemination of information in capital markets affects asset pricing, financial contracting, and corporate governance. Prerequisite: Economics 149 or 181. One course. *Staff*

**184S. Canadian Issues.** (SS) Does not count as one of the courses at the 100-level or higher for either of the economics major or minor. Prerequisite: Canadian Studies 98 or consent of instructor. See C-L: Canadian Studies 184S; also C-L: Comparative Area Studies, Cultural Anthropology 184S, History 184S, Political Science 184S, and Sociology 184S. One course. *Staff*

**185S. The Canadian Health Care System.** (SS) Does not count as one of the courses at the 100-level or higher for either of the economics major or minor. See C-L: Canadian Studies 185S; also C-L: Comparative Area Studies, Cultural Anthropology 185S, History 108E, Political Science 185S, Public Policy Studies 187S, and Sociology 185S. One course. *Warren*



**187. Public Finance. (SS)** Economic aspects of the allocative and distributive role of government in the economy, the incidence and efficiency of taxation, the effects of taxation on behavior, and analysis of major government spending programs. Prerequisite: Economics 149. One course. *Staff*

**188. Industrial Organization. (SS)** Economic theories of the behavior of firms within industries. Emphasis upon incentives and the role of information when firms are mutually interdependent. Topics include the agency problem, entry, research and development, collusion, and various pricing schemes. Analysis conducted within a number of regulatory environments. Prerequisites: Economics 149 and statistics, or consent of instructor. One course. *Staff*

**189. Business and Government. (SS)** Public policies which most directly affect the operation of competition in the business world. The economic basis for an evaluation of antitrust policy, public utility regulation, and public enterprise. Prerequisites: Economics 149 and Statistics 110B, or consent of instructor. One course. *Grabowski or Vernon*

**190. The Development of Modern Economic Thought. (SS)** Selective survey of the development of economic thinking in the twentieth century, with emphasis on the construction of economics as a science. Prerequisites: Economics 1D or 51D, and Economics 2D or 52D. One course. *De Marchi or Weintraub*

**191, 192. Independent Study.** Directed reading and research. Consent of instructor and director of undergraduate studies required. One course each. *Staff*

**193, 194. Independent Study.** Same as Economics 191, 192, but for seniors. One course each. *Staff*

**195, 196. Selected Topics in Economics.** One course each. *Staff*

**199. Distributive Justice and the Social Sciences. (SS)** Welfarism: classical utilitarianism versus egalitarianism (Harsanyi versus Rawls). Democratic rights: voting rules and preference aggregation (Arrow's theorem). Liberalism: competitive equilibrium, destructive competition, and inefficient decentralization. Welfarism versus resourcism. Mechanism design and the microeconomic approach to justice. Prerequisites: Economics 1 or 51 and Economics 2 or 52. C-L: Political Science 175A. One course. *Moulin*

### **For Advanced Undergraduates and Graduates**

**200S. Senior Seminars.** Special topics courses open only to students with senior standing and completing a major in economics. Consent of individual instructor may be required. One course. *Staff*

**205S. Advanced Monetary Theory and Policy. (SS)** The theory of monetary policy from Keynesian, neoclassical and classical perspectives. Public choice and political economy approaches to monetary policy. The term structure interest rates. Portfolio theory. The theory of the financial services firm. Theories of financial regulatory policy. Prerequisites: Economics 153 and Statistics 110B. One course. *Staff*

**208S. Economics of the Family. (SS)** Economic functions of families including home production gains from marriage, the demand for children, marriage and divorce, child support and alimony, labor supplies of women and men, the distribution of resources within families ("rotten kid theorems" and cooperative and noncooperative games). Applications to marriage and divorce law, day care, U.S. welfare policy, mortality, and farm efficiency in developing nations. Prerequisites: Economics 149 and Statistics 110B. One course. *McElroy*

**216S. Economics of Education. (SS)** Topics include investment in human capital, return to and demand for education, the production function for schooling, public expenditures on schools, effectiveness of private and public schools, the distribution of public educational



expenditures, public financing of higher education, inflation in college costs, and labor markets for teachers and professors. Emphasis on students' research projects. Prerequisite: Economics 149 or Public Policy Studies 110. C-L: Public Policy Studies 216S. One course. *Clotfelter*

**218. Macroeconomic Policy.** (SS) Does not count for undergraduate economics major requirements. See C-L: Public Policy Studies 218. One course. *Lapp*

**219S. Economic Problems of Underdeveloped Areas.** (SS) Analysis of underdeveloped countries with attention to national and international programs designed to accelerate development. Prerequisite: Economics 149 or consent of instructor. C-L: Comparative Area Studies. One course. *Kelley or Wallace*

**220S. Computer Modeling for Policy Analysis.** (SS) Introduction to the use of computer techniques in economic policy evaluation; policy applications to international economics, public finance and development economics; computer analysis of linearized and nonlinear models. Students required to complete a major modeling project. Prerequisites: Economics 149 and Economics 154. One course. *Tower*

**225S. Games and Information.** (SS) Noncooperative game theory with emphasis upon incomplete/imperfect information and incentive contracting. Applications to insurance (deductibles, coinsurance), labor (piece rates, sharecropping, profit sharing), real estate (commission sales), and law (contingent contracts). Prerequisites: Economics 149 and Statistics 110B. One course. *Graham*

**236. The International Economy Since 1800.** (CZ, SS) Same as Economics 136, but requires an additional paper; not open to students who have taken Economics 136. Prerequisite: Economics 1D or 51D; recommended: Economics 154. One course. *Toniolo*

**239. Introduction to Econometrics.** (QR) Data collection, estimation, and hypothesis testing. Use of econometric models for analysis and policy. (Same as Economics 139 but requires additional term paper; not open to students who have taken Economics 139.) Prerequisites: Economics 2 or 52 and Mathematics 32 or equivalent and Statistics 110B. One course. *Sieg, Tauchen, or Wallace*

**240. Comparative Economic Systems.** (SS) Analysis and comparison of basic economic systems; market versus centrally planned economies; decision making, information, property rights (income and control), and incentives. Western industrialized market economies compared with Soviet-type command economies. Analysis of change, reforms, and of economic problems of systems transformation. Not open to students who have taken Economics 140. Prerequisites: Economics 1 or 51, and 2 or 52. C-L: Comparative Area Studies. One course. *Trembl*

**241. Applied Econometrics.** (QR) Covers basic econometric methods useful in empirical economic research and forecasting. Topics include multiple regression analysis under nonstandard conditions; probit, logit, and other limited dependent variables; count data; simultaneous equation systems; and basic models with panel data. (Same as Economics 141, but requires additional paper; not open to students who have taken Economics 141.) Prerequisites: Economics 139, Mathematics 104, and Statistics 110B or equivalent. One course. *An*

**242S. Chinese Economy in Transition.** (SS) Evolution of the Chinese economy since 1949. Exposition of alternative economic systems, the commune, incentive problems and state enterprises. Analysis of recent reforms and their effects on economic efficiency: agricultural growth, changes in ownership structures, financial markets, reforms and inflation, privatization, gradualism and shock treatment. Through a research project students develop

expertise in one aspect of the Chinese economy. (Same as Economics 142S but requires additional paper; not open to students who have taken Economics 142 or 142S.) Prerequisites: Economics 1 or 51, and 2 or 52. C-L: Comparative Area Studies and Public Policy Studies 242S. One course. *Yang*

**246. Adam Smith and the System of Natural Liberty. (SS)** Same as Economics 146, but requires an additional paper; not open to students who have taken Economics 146 or 151. One course. *De Marchi*

**249. Microeconomics. (SS)** Cost and supply considerations in price theory; the demand for factors of production. The allocation of resources in the context of competitive and monopolistic market structures. (Similar to Economics 149 but at a more advanced level; not open to students who have taken Economics 149.) One course. *Graham, Trembl, Vernon, or Zhou*

**251S. Regulation of Vice and Substance Abuse. (SS)** Prerequisite: Economics 149 or Public Policy Studies 110. See C-L: Public Policy Studies 251S. One course. *Cook*

**252. Mercantile Culture and Art in the Netherlands. (CZ)** Same as Economics 152, but requires additional assignments; not open to students who have taken Economics 152 or Art History 155. One course. *De Marchi and Van Miegroet*

**254. Macroeconomics. (SS)** Concepts and measurement of national income and expenditures, employment, interest rates, and price levels; the theoretical determination of these aggregates; applications of macroeconomic theory to business cycles and economic growth. (Similar to Economics 154 but at a more advanced level; not open to students who have taken Economics 154.) One course. *Connolly, Kimbrough, Mendoza, or Yohe*

**254L. Macroeconomics. (SS, QR)** Same as Economics 254, except includes a weekly computer lab. Microsoft Excel used to estimate economic models using regression analysis and to simulate linearized economic models using matrix methods. Similar to Economics 154L but at a more advanced level; not open to students who have taken Economics 154, 154L, or 254. One course. *Tower*

**255S. Labor Economics: Analysis and Measurement. (SS)** Labor market equilibria. The demand for labor. The supply of labor: human fertility, human capital, hours of work, and labor force participation. Wage levels and differences. Union and government as labor market factors. (Same as Economics 155S, but requires additional paper; not open to students who have taken Economics 155S.) Prerequisites: Economics 149, Mathematics 31, and Statistics 210B or equivalent. One course. *McElroy or Yang*

**257S. Business Cycles and Economic Forecasting. (SS)** Causes of fluctuations in economic activity and conventional methods of forecasting micro- and macroeconomic variables, using microcomputer programs. (Similar to Economics 157S, but requires an additional assignment. Not open to students who have taken Economics 157S.) One course. *Staff*

**258. Financial Markets and Investments. (SS)** The tools learned in microeconomics, macroeconomics, basic mathematics, and statistics applied to problems in financial economics. A blend of pure economic theory, an investigation of financial data, and practical applications using personal computers. Not open to students who have had Economics 158. Prerequisites: Economics 149, Economics 154, and a statistics course—preferably Statistics 110 or 210. One course. *Burmeister or Tauchen*

**259S. State and Local Public Finance. (SS)** Prerequisite: Public Policy Studies 217 or equivalent. See C-L: Public Policy Studies 259S. One course. *Ladd*

**260. Economic Policy Analysis of Nonrenewable Resources. (SS)** Prerequisite: Economics 149, Public Policy Studies 110, or Public Policy Studies 232. See C-L: Public Policy Studies 260. One course. *Conrad*

**261. Evaluation of Public Expenditures. (SS)** Not open to students who have taken Economics 285. See C-L: Public Policy Studies 261; also C-L: Environment 272, and Health Policy. One course. *Conrad*

**262S. Seminar in Applied Project Evaluation. (SS)** Prerequisite: Economics 285 or Public Policy Studies 261. See C-L: Public Policy Studies 262S. One course. *Conrad*

**263. Environmental Economics: Quantitative Methods and Applications. (SS)** Uses envirometrics—mathematical programming, multivariate statistics, and simulation techniques—to address environmental problems; properties of economic instruments for externality problems developed with programming models; regression and maximum likelihood techniques used in nonmarket valuation; and simulation in applied benefit and cost analysis. Prerequisite: Economics 149. C-L: Environment 263. One course. *Smith*

**264. Formulating Macroeconomic Concerns, 1936-86. (SS)** Same as Economics 164, but requires an additional paper; not open to students who have taken Economics 164. Prerequisite: (or corequisite) Economics 154/254. One course. *De Marchi*

**265S. International Trade. (SS)** International trade, investment and migration, commercial policy, and the political economy of trade. Prerequisite: Economics 149, 154. C-L: Canadian Studies. One course. *Tower*

**266S. International Monetary Economics. (SS)** Financial aspects of growth and income determination, and macroeconomic policy in open economies. Applications to exchange rate determination, capital markets, the history of international monetary regimes, international policy coordination, currency crises, and monetary reform. Prerequisite: Economics 149, 154. One course. *Kimbrough*

**267. Multinational Management. (SS)** Economic, political, and legal variables which influence the form of organization. Multinational enterprise and foreign direct investment. (Same as Economics 167, but requires an additional paper; not open to students who have taken Economics 167.) Prerequisite: Economics 149. One course. *Staff*

**269. Microeconomic Analysis. (SS)** The basic tools for using microeconomic analysis to address practical economic problems. Topics include consumption, production, externalities, partial equilibrium, and general equilibrium. Applications drawn from labor markets, public goods, cost/benefit analysis, and optimal taxation. The level of the course is between intermediate microeconomics (Economics 149/249) and the core Ph.D. microeconomics sequence (Economics 301/302). One course. *Yang*

**270. Resource and Environmental Economics. (SS)** Prerequisite: introductory course in microeconomics. See C-L: Environment 270; also C-L: Public Policy Studies 272. One course. *Kramer*

**272. Economic Analysis of Resource and Environmental Policies. (SS)** Prerequisite: Environment 270 or equivalent; Economics 149 recommended. See C-L: Environment 271. One course. *Mansfield*

**275. Economics of Modern Latin America. (SS)** The remarkable shift that has taken place in various countries of Latin America from a statist, import substitution model of development towards a more free-market economy. Emphasis on case studies of individual countries and specific policies including opening markets to foreign trade and investment, privatization, deregulation, creation of private pension systems, and building greater transparency in financial markets. The end of Latin American debt crises and prospects for hemispheric integration. (Same as Economics 175, but requires an additional paper; not open to students who have taken Economics 175.) Prerequisites: Economics 1 or 51 and 2 or 52; or



consent of instructor. C-L: Comparative Area Studies and Latin American Studies. One course. *Staff*

**281. Corporate Finance.** (SS) Same as Economics 181, but requires an additional paper; not open to students who have taken Economics 181. One course. *Staff*

**282S. Canada.** (SS) See C-L: Canadian Studies 282S; also C-L: Comparative Area Studies, Cultural Anthropology 282S, History 282S, Political Science 282S, and Sociology 282S. One course. *Staff*

**283. Agency and Accounting.** (SS) The production and use of information in corporate decision making and financial markets. The theory of principals and agents. The relationship between the structure of information flows and incentives within the firm and the impact of that relationship on the firm's operations, organizational form, capital structure, and compensation scheme. How the dissemination of information in capital markets affects asset pricing, financial contracting, and corporate governance. (Same as Economics 183, but requires additional paper. Not open to students who have taken Economics 183.) Prerequisite: Economics 149/249 or 181. One course. *Staff*

**284S. American Financial Development and History.** (SS) Development of American financial institutions and markets from the colonial period to the present. The political, economic, and institutional factors which influenced that evolution and the theoretical implications for contemporary emerging markets. Prerequisite: Economics 181 or consent of instructor. One course. *Staff*

**286S. Economic Policy-Making in Developing Countries.** (SS) See C-L: Public Policy Studies 286S; also C-L: Comparative Area Studies, and Latin American Studies. One course. *Conrad or Ramachandran*

**287. Public Finance.** (SS) Economic aspects of the allocative and distributive role of government in the economy, the incidence and efficiency of taxation, the effects of taxation on behavior, and analysis of major government spending programs. Not open to students who have had Economics 187. (Taught concurrently with Economics 187 but requires additional graduate-level work.) Prerequisite: Economics 149. One course. *Sieg*

**288S. Current Issues in United States Federal Tax Policy.** (SS) Evaluation of the equity and efficiency of United States tax policy. Topics include: (1) personal consumption versus income taxation and (2) restructuring the taxation of corporate income. Emphasis on the effects of taxes on savings, investment, and the international economy. Prerequisite: Economics 149 or consent of instructor. C-L: Public Policy Studies 288S. One course. *Staff*

**291. Issues in European Economic History.** (SS) Covers period since the late eighteenth century. Topics include: modern economic growth in historical perspective, the industrial revolution, the standard-of-living debate, patterns of European growth (with case studies of France, Germany, Italy, and Russia), the classical gold standard, the economic consequences of World War II, the great depression, postwar reconstruction, and the European "miracle" of the 1950s and 1960s. One course. *Toniolo*

**292S. Issues in the Transition of Economic Systems.** C-L: Comparative Area Studies. One course. *Staff*

**293S. Russian Economic History.** (SS) From 1917 through the present. Foundations of the command economy and promises of socialism—rejection of markets, establishment of central planning, industrialization, collectivization of agriculture; economic reforms. Gorbachev's perestroika, collapse of the Soviet system, and emerging market economy in Russia. C-L: Comparative Area Studies. One course. *Trembl*



**294S. Soviet Economy in Transition. (SS)** Economic planning and administration in the Soviet Union. Theoretical and applied problems of resource allocation, economic development, and optimal micro decision making in a nonmarket economy. Gorbachev's perestroika, search for a new model, and the collapse of the Soviet system. C-L: Comparative Area Studies. One course. *Trembl*

**295, 296. Selected Topics in Economics. (SS)** One course each. *Staff*

**299. Distributive Justice and the Social Sciences. (SS)** Welfarism: classical utilitarianism versus egalitarianism (Harsanyi versus Rawls). Democratic rights: voting rules and preference aggregation (Arrow's theorem). Liberalism: competitive equilibrium, destructive competition, and inefficient decentralization. Welfarism versus resourcism. Mechanism design and the microeconomic approach to justice. (Similar to Economics 199, but requires an additional assignment. Not open to students who have taken Economics 199.) One course. *Moulin*

### Senior Seminars

**201S, 202S. Current Issues in Economics. (SS)** Economic analysis of such issues as the health care system, crime and punishment, pollution and the environment, the performing arts, welfare, and the energy crisis. Prerequisites: for 201S, Economics 149 and statistics; for 202S, Economics 201S. One course each. *Weintraub*

**206S. Regulation and Industrial Economics. (SS)** Analysis of industrial competition and performance in industries such as automobiles, telephones, cable TV, airlines, pharmaceuticals, tobacco, and health care services. Analysis of the efficiency of regulation and other public policy programs. Prerequisites: Economics 149 and statistics. One course. *Grabowski*

**209S. Global Issues in Population and Development. (SS)** Relationship of population growth to economic development and to natural resource and environmental pressures. Causes and impacts of population change, including economic models of fertility, mortality, marriage, and migration. Prerequisites: Economics 149 and 154. One course. *Kelley*

**212S. Economic Science and Economic Policy. (SS)** An historical and contemporary examination of the impact of economics on public policy. Topics vary each semester and have included energy and anti-inflationary policy, productivity growth, the Third World, and the Council of Economic Advisers. Different sources of economic ideas in the policy process. Prerequisites: Economics 149, 154, and consent of instructor. One course. *Goodwin*

### COURSES CURRENTLY UNSCHEDULED

- 65. Japanese Business Management. (SS)
- 69. Australia and the Asia-Pacific Economies. (SS)
- 108. Economics of War. (SS)
- 144. Education, Development, and Growth. (SS)
- 169, 170. Microeconomic Analysis I and II. (SS)
- 198S. Economics of Regulation. (SS)
- 203S. Mathematical Economics. (SS)
- 207. Models of Conflict and Cooperation. (SS)
- 207S. Models of Conflict and Cooperation. (SS)
- 211S. Current Problems in Aggregate Supply. (SS)
- 215S. Applied Cost Benefit Analysis. (SS)
- 224S. Economics of the Law. (SS)
- 231S. Economic Development in Latin America. (SS)
- 234. Japanese Economy and Its History. (SS)

- 235. The Economics of Crime. (SS)
- 244. Education, Development, and Growth. (SS)
- 248. History of Economic Thought. (SS)
- 253. Econometric Methods. (QR)
- 271S. Behavioral and Experimental Economics. (SS)
- 273. Economics of Organization and Management. (SS)
- 280S. Fundamentals of Political Economy. (SS)

## THE ECONOMICS MAJORS AND MINOR

The Department of Economics publishes a handbook to guide economics majors and minors. A copy may be obtained from the assistant to the director of undergraduate studies. For both the majors and the minor, substitution of similar courses in other departments at Duke for courses in the Economics Department is not permitted.

## THE MAJORS

### For the A. B. Degree

*Prerequisites.* Introductory macroeconomics: Economics 1 (A or D) or 51D. Introductory microeconomics: Economics 2 (A, D, or S) or 52D. Mathematics 25L and 26L, or 31 or 31L, or advanced placement credit for Mathematics 31. A course in statistical methods at the 100 level or above (the best statistics course for most economics majors is Statistics 110B). Statistics courses currently acceptable include Mathematics 136, Psychology 117, Public Policy Studies 112, Sociology 133, and any course at or above the 100 level in the Institute of Statistics and Decision Sciences.

*Requirements.* Economics 149 or 249 and Economics 154, 154L, 254, or 254L and any five additional economics courses at the 100 level or above. Students who have taken Public Policy Studies 110 instead of Economics 149 must take an additional economics course at the 100 level or above.

### For the B.S. Degree

The Bachelor of Science degree in economics signifies achievement of proficiency in quantitative skills and experience in applying these to economics. It is recommended for students who plan to do graduate study in economics and graduate business programs, and for students interested in employment in business or government agencies where these skills would be valuable. Students who contemplate graduate study in economics are urged to develop skills in multivariate calculus (Mathematics 103), linear algebra (Mathematics 104), differential equations (Mathematics 111) and advanced calculus (Mathematics 139). Students interested in graduate work in business administration may wish to focus less on mathematics and more on computer science, statistics and quantitative economics.

*Prerequisites.* Introductory macroeconomics: Economics 1 (A, D, or S) or 51D. Introductory microeconomics: Economics 2 (A, D, or S) or 52D. A course in statistical methods at the 100 level or above (the best statistics course for most economic majors is Statistics 110B). Statistics courses currently acceptable include Mathematics 136, Psychology 117, Public Policy Studies 112, Sociology 133, and any course at or above 100 level in the Institute of Statistics and Decision Sciences). Mathematics 103.

*Requirements.* Economics 139 or 239; Economics 149 or 249; and Economics 154, 154L, 254, 254L. Any four additional economics courses at the 100 level or above, plus any two additional courses drawn from the following: computer science at any level, 100 level or above courses in mathematics, 100 level or above courses in Statistics, the following quantitatively oriented economics courses: 158 or 258, 171S or 271S, 181 or 281, 203S, 207, 220S, 225S, 257S. Students who take Public Policy Sciences 110 instead of Economics 149 must take an additional economics course at the 100 level or above.

## Graduation with Distinction

For graduation with departmental distinction at least one honors seminar and an honors paper are required. Prerequisites for admission to an honors seminar, upon invitation to take such a seminar extended by the director of the honors program (Professor Goodwin), are two of the following courses: Economics 149, 154, and an approved statistics course. The proposed program of research must be approved in advance by the faculty sponsor and the director of the honors program. See the section on honors in this bulletin.

## THE MINOR

*Requirements.* Five courses in economics including introductory macroeconomics: Economics 1 (A, D, or S) or 51D; introductory microeconomics: Economics 2 (A, D, or S) or 52D; and three courses at the 100 level or above including at least one intermediate level economic theory course: Economics 149, 249, 154, 154L, 254, or 254L. Students with Advanced Placement credit for either or both Economics 1A and 2A must substitute the same number of additional economics courses. Such courses may be drawn from all courses taught in the Economics Department, including freshman seminars and economics courses in the Duke study abroad programs. Students who have taken Public Policy Studies 110 instead of Economics 149 must take an additional economics course at the 100 level or above.

## Education (EDU)

Research Professor Goldstein, *Director*; Assistant Professor of the Practice Malone, *Director of Undergraduate Studies*; Associate Professors Di Bona and Sawyer; Professors of the Practice Ballantyne and Beckum; Adjunct Professor Trask; Adjunct Associate Professors Martin and Wilson; Adjunct Assistant Professor Bryant; Adjunct Assistant Professor of the Practice Lattimore; Lecturer Riggsbee; Adjunct Lecturer Wasiolek

Students who desire an understanding of the field of education as part of their liberal arts program should elect courses in accordance with their special interests. Selected courses in education may satisfy requirements in the social sciences area of knowledge. Students interested in licensure to teach secondary school should consult the secondary program coordinator. Students interested in licensure to teach elementary school should consult the elementary program coordinator.

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**100. Social and Philosophical Foundations of Education. (SS)** Basic features and assumptions, viewpoints, and issues of education in contemporary America. C-L: Perspectives on Marxism and Society. One course. *Di Bona or staff*

**108S. Teaching Practices in Elementary Language Arts and Content Areas. (SS)** Research, theories, and practices of language arts, social studies, science, and mathematics instruction in the elementary school. Introduction to appropriate strategies and methodologies that reflect proven educational practices and research. A planned, sequential field-based experience in a model public school is provided. One course. *Riggsbee*

**109S. Elementary Curriculum.** Seminar in curriculum development. Principles, practices, and problems of instruction. For student teachers only. One course. *Bryant or staff*

**117S. Psychology of Personal and Social Adjustment. (SS)** Principles of mental health affecting individual and social adjustments. One course. *Malone*

**118. Educational Psychology. (SS)** Emotional and cognitive learning in children, youth, and adults. One course. *Malone or staff*

**120. Elementary Education: Internship.** Supervised internship in a teaching center in an elementary school, involving full-time teaching. For student teachers only. Two courses. *Riggsbee*

**121. Infancy, Early Childhood, and Educational Programs. (SS)** Developmental theories and their practical application in education. Emphasis on parenting and teaching. One course. *Riggsbee*

**139. Marxism and Society. (SS)** See C-L: Cultural Anthropology 139; also C-L: Comparative Area Studies, History 186, Literature 181, Perspectives on Marxism and Society, and Sociology 139. One course. *Staff*

**140. The Psychology of Work. (SS)** Factors affecting career choice and change. One course. *Ballantyne*

**143. Education, Culture, and Identity. (SS)** See C-L: Cultural Anthropology 143; also C-L: African and African-American Studies 143. One course. *Luttrell*

**149S. Exceptional Children. (SS)** Etiology and assessment of major types of exceptionalities, including intellectual abilities, physical or emotional handicaps, and sensorially impaired. Family relationships and treatment programs. One course. *Staff*

**160S. Early Childhood Internship.** Internship in early childhood programs, involving supervised experience and a reflective seminar. For Early Childhood Education Studies Certificate students only. One course. *Chafe or staff*

**170, A-O. Selected Topics.** One course. *Staff*

**178S. The Psychology of Exceptional Ability. (SS)** The Duke University Talent Identification Program (TIP) will be a focus as well as a resource. Prerequisites: courses in either developmental or cognitive psychology and statistics recommended. See C-L: Psychology 178S. One course. *Goldstein*

**180S, 181S. Poverty and Public Education. (SS)** Prerequisite: for Public Policy Studies 171S/ Education 181S: Public Policy Studies 170S/ Education 180S. See C-L: Public Policy Studies 170S, 171S. One course each. *Beckum*

**190. Trends, Techniques, and Innovative Technologies for the Twenty-first Century. (SS)** Focus on the schools and classrooms of the twenty-first century as molded by five issues: diversity of student population, curriculum design, alternative assessment, technological innovation, and professionalization of educators. Examination of the theoretical basis of these issues; concentration on the practical implications for public and private schools. Includes structured weekly field-based experience in the local schools. One course. *Staff*

**191, 192. Independent Study.** Directed reading and research for juniors. Consent of instructor and director of undergraduate studies required. One course each. *Staff*

**193, 194. Independent Study.** Directed reading and research for seniors. Consent of instructor and director of undergraduate studies required. One course each. *Staff*

#### **For Seniors and Graduates**

**205, 206. Selected Topics.** One course each. *Staff*

**209. Global Education. (SS)** A comparative survey of major educational changes and reforms in selected countries designed to illustrate general similarities and differences in the policies of developing and industrialized societies. Emphasis on American educational issues in the context of the emerging global economy. One course. *Di Bona*



**211. Education and the Mass Media. (SS)** Impact of mass media on behavior, particularly of children. One course. *Di Bona*

**215S. Seminar in Secondary School Teaching.** Principles, practices, and problems in secondary school instruction. One course. *Staff*

**216. Secondary Education: Internship.** Supervised internship in a teaching center in a senior high school involving some full-time teaching. For student teachers only. Two courses. *Staff*

**232. Learning and Living in Families.** Role and function of the family as related to the development and behavior of its members, to gender identification, to parenting, and to interactions among family members. One course. *Ballantyne*

**242S. Group Interactions.** Examination of theoretical issues and processes involved in the dynamics of, and learning in, small groups of children, adolescents, parents, other adults, with attention to problem-oriented groups. One course. *Ballantyne*

### **COURSES CURRENTLY UNSCHEDULED**

**103S. American Educational Theory. (SS)**

**155S. Tests and Measurements. (SS)**

**168S. Contemporary Education Criticism. (SS)**

**171T, 172T. Junior-Senior Tutorials.**

**173, 174. Clinical Reading Practicum.**

**210S. Higher Education in Latin America. (SS)**

**212S. Pedagogy and Political Economy: A World View. (SS)**

**227. Contemporary Theories of Counseling and Psychotherapy. (SS)**

**248. Practicum in Counseling.**

### **UNIVERSITY PROGRAM FOR PREPARATION FOR TEACHING**

Duke University offers programs to prepare students to become licensed teachers in elementary and secondary schools. As students complete requirements of Trinity College and of a selected major they may also fulfill requirements of an approved Duke teacher preparation program and become licensed to teach. Licensure by the Duke approved program is authorized through the State Board of Education in North Carolina and is reciprocal with most states. A license to teach along with an undergraduate degree is required by most public school systems and is recommended by many independent schools.

Brief descriptions of two undergraduate programs based on Bachelor of Arts or Bachelor of Science degrees (secondary school teaching and elementary teaching) are followed by a description of a program for secondary teaching based on a Master of Arts in Teaching degree. The goals of and criteria for admission to any of these programs are available from the respective offices.

Duke University is accredited by the North Carolina Department of Public Instruction and the National Council For Accreditation of Teacher Education (NCATE), and has reciprocal approval for initial licensure with most of the fifty states.

#### **Secondary School Teaching (A.B. or B.S. degree)**

Students who are majors in the departments of English or mathematics may become eligible to be licensed to teach in their fields. Majors in biological anthropology and anatomy, biology, chemistry, environmental studies, geology, or physics may become eligible to be licensed to teach high school science. Majors in cultural anthropology, economics, history, political science, psychology, public policy, religion, or sociology may become eligible to be licensed to teach social studies. Prospective teachers are advised to consult with their major academic advisors and the secondary program coordinator concerning their interest in teaching and in being accepted into the preparation program.

Interested undergraduate students may apply to the secondary school teaching program in the spring of their sophomore year or the fall of their junior year. Students are accepted by competitive criteria into a program which includes education courses with field experiences in schools, and an intensive senior spring semester teaching internship. During the internship students teach high school classes in their respective disciplines under the supervision of an experienced teacher and a university professor.

Upon completion of the senior year spring internship semester, and upon completion of the four-year Trinity College undergraduate degree, students may apply for licensure.

### **Elementary Teaching (A.B. or B.S. degree)**

Undergraduate students who plan to teach young children (usually kindergarten through grade six) may become eligible for licensure to teach while at Duke in addition to completing any academic major offered by Trinity College. The Elementary Program includes academic coursework and an intensive senior fall semester internship.

Interested undergraduate students should apply to the elementary program in the fall of the junior year. Students are selected by competitive criteria for participation in the program. An intensive senior fall semester links together a teaching internship in a local public school, seminars, and independent directed research (four course credits). Students selected for the elementary teaching program are placed as interns with teachers in an elementary school and are also supervised by a Duke professor. Duke student interns begin their teaching internship during preservice days before Duke classes begin.

Upon completion of the senior year fall semester internship and the four-year Trinity College undergraduate degree, students may apply for elementary teaching licensure.

### **Master of Arts in Teaching (MAT) in Secondary Schools**

The Master of Arts in Teaching Program is designed for students who wish to teach their discipline in secondary schools by completing a graduate degree. Entry into the MAT Program is targeted for the second semester of the student's senior year. The normal sequence for MAT coursework may begin in the spring semester of the senior year. Courses may not be double-counted toward both the bachelor's and MAT degrees. Additional information is available from the Office of the Dean of the Graduate School. This program is approved for teacher certification by the State Board of Education in North Carolina and is reciprocal with most states.

### **EARLY CHILDHOOD EDUCATION STUDIES CERTIFICATE PROGRAM**

The six-course Early Childhood Education Studies Certificate Program allows students to develop a specialization in early childhood development by pursuing studies in psychology, sociology, cultural anthropology, and education, and by participating in a supervised internship experience with child care centers, preschools, and families. The certificate requires two specific courses: Education 121 and the capstone internship Education 160. The first provides a comprehensive view of early childhood education, its history, programs, and current issues; the second provides direct experience under supervision in an approved child care center combined with bi-weekly group discussions with a Duke internship supervisor. No more than three courses that originate in a single academic unit may be taken; the internship is open only to students seeking the certificate.

The certificate in Early Childhood Education Studies will help qualify students to provide leadership in child care centers, to raise standards in communities for improved early childhood programs, or to identify an area for postbaccalaureate study. Students with interests in social work, education, child psychology, pediatrics, and policy issues will enhance their understanding of these areas through study in this program. For additional information consult the Program in Education.

### Introductory course

Education 121. *Infancy, Early Childhood, and Educational Programs. Riggsbee*

Four courses, at least two in each area:

#### Development of the Child:

Psychology 97. *Developmental Psychology: Introduction and Survey. Hill, Needham, or Putallaz*

Psychology 121. *Early Cognitive Development. Needham*

Psychology 124. *Human Development. Gustafson, Maxson, or staff*

Psychology 131. *Early Social Development. Hill or Putallaz*

Psychology 136. *Developmental Psychobiology. Eckerman*

Psychology 159S. *Biological Psychology of Human Development. Thompson*

Psychology 183B,S. *Child Observation. Putallaz*

Psychology 205S. *Children's Peer Relations. Asher or Putallaz*

*or*

Psychology 206S. *Pediatric Psychology. Thompson*

Psychology 214S. *Development of Social Interaction. Eckerman*

Education 118. *Educational Psychology. Malone or staff*

#### Conditions of Childhood:

Cultural Anthropology 112. *Current Topics in Linguistics. Staff*

Cultural Anthropology 143. *Education, Culture, and Society. Luttrell*

Cultural Anthropology 280S. *Selected Topics: Advertising and Childhood. O'Barr*

Education 232. *Learning and Living in Families. Ballantyne*

Sociology 111. *Social Inequality: An International Perspective. DiPrete or O'Rand*

Sociology 117. *Childhood in Social Perspective. Simpson*

Sociology 118. *Sex, Gender, and Society. Buchmann or O'Rand*

Sociology 123. *Social Aspects of Mental Illness. George or Jackson*

Sociology 150. *The Changing American Family. Simpson*

Sociology 169. *Psychosocial Aspects of Human Development. Staff*

Sociology 215. *Basic Demographic Methods and Materials. Morgan*

#### Supervised Internship:

Education 160. *Early Childhood Internship. Chafe or staff*

## English (ENG)

Professor Torgovnick, *Chair*; Associate Professor Tetel, *Associate Chair*; Professor Butters, *Director of Undergraduate Studies*; Professors Aers, Applewhite, Clum, C. Davidson, DeNeef, Fish, Gleckner, Goldberg, Holloway, Jackson, Moon, Pope, Porter, Price, Randall, Ryals, Sedgwick, B. H. Smith, Strandberg, Tompkins, and K. Williams; Associate Professors Beckwith, Ferraro, Gaines, Jones, Moses, Pfau, and Willis; Assistant Professors Baucom, Chandler, Clarke, Shannon, Thorn, and Tucker; Associate Professors of the Practice Cox and Malouf; Assistant Professor of the Practice Hillard; Adjunct Professor of the Practice of Rhetoric Gopen; Adjunct Professor A. Davidson; Adjunct Associate Professor Ruderman; Adjunct Assistant Professors Kennedy, Sasson, and Wittig

A major or minor is available in this department.

### WRITING AND LANGUAGE

27S. *Studies in Nonliterary Topics. May be taken twice. One course. Staff*

29. *Composition and Language. Credit for Advanced Placement on the basis of the College Board examination in composition and language. One course.*

48A, S. *Focus Program Seminar on Writing or Language. Topics vary each semester offered. One course. Staff*

49A, S. *First-Year Seminar on Writing or Language. Topics vary each semester offered. One course. Staff*

**63S. Introduction to Creative Writing. (AL)** One course. *Staff*

**100A, S. Writing: Fiction. (AL)** Instruction in the writing and study of fiction. Recommended for students before they take English 103S, 104S, 110S, 202S, or 203S. Consent of instructor required. One course. *Staff*

**100B, S. Writing: Drama. (AL)** Instruction in the writing and study of drama. Recommended for students before they take English 102S or 107S. Consent of instructor required. One course. *Staff*

**100C, S. Writing: Poetry. (AL)** Instruction in the writing and study of poetry. Recommended for students before they take English 105S or 106S. Consent of instructor required. One course. *Staff*

**102S. Screenwriting. (AL)** Consent of instructor required. Not open to students who have taken Drama 113S. See C-L: Drama 123S; also C-L: Film and Video. One course. *Wilson*

**103S, 104S. Writing: Short Stories. (AL)** Class discussion of students' manuscripts, individual conferences with the instructor. Open to sophomores, juniors, and seniors; recommended for, but not limited to, students who have taken English 100A. Consent of instructor required. One course each. *Applewhite, Cox, Malouf, Pope, Porter, or Price*

**105S, 106S. The Writing of Poetry. (AL)** Meter, image, tone, and dramatic organization in traditional and modern poems as a basis for original composition. Open to sophomores, juniors, and seniors; recommended for, but not limited to, students who have taken English 100C. Consent of instructor required. One course each. *Applewhite, Clarke, or Pope*

**107S. Dramatic Writing. (AL)** Open to sophomores, juniors, and seniors; recommended for, but not limited to, students who have taken English 100B. Not open to students who have taken the former Drama 111S. Prerequisites: a practical theater course (for example, acting, directing, design, stagecraft) and consent of instructor. See C-L: Drama 121S; also C-L: Film and Video. One course. *Clum or Wilson*

**108S. Advanced Dramatic Writing. (AL)** Not open to students who have taken the former Drama 112S. Prerequisites: Drama 121S and consent of instructor. See C-L: Drama 122S; also C-L: Film and Video. One course. *Wilson*

**109S. Special Topics in Writing. (AL)** Consent of instructor required. One course. *Staff*

**110S. Writing: Longer Prose Narrative. (AL)** The writing of a novel, novella, or group of short stories. Primarily for juniors and seniors. Consent of instructor required. One course. *Cox, Porter, or Price*

**111. Introduction to Linguistics. (SS)** See C-L: Linguistics 101; also C-L: Comparative Area Studies, and Cultural Anthropology 107. One course. *Butters or Tetel*

**112. English Historical Linguistics. (SS)** Introduction to methods and principles of historical linguistics, as exemplified by the history of the English language from Proto-Indo-European to the present. Not open to students who have taken English 208. C-L: Linguistics. One course. *Butters or Tetel*

**114. Languages of the World. (SS)** See C-L: Linguistics 102; also C-L: Comparative Area Studies, and Cultural Anthropology 114. One course. *Andrews or Tetel*

**115. Gender and Language. (SS)** See C-L: Russian 174; also C-L: Cultural Anthropology 174, Linguistics, and Women's Studies. One course. *Andrews*

**116A, S. Scientific Writing. Prerequisite:** University Writing Course 4, 5, 6, 7, or 12. See C-L: University Writing Course 112S. One course. *Staff*



**117A, S. Advanced Composition I.** See C-L: University Writing Course 117S. One course. *Staff*

**117B, S. Advanced Composition II.** Prerequisite: successful completion of English 117A. See C-L: University Writing Course 118S. One course. *Staff*

**119. Current Topics in Linguistics. (SS)** See C-L: Cultural Anthropology 112; also C-L: Linguistics. One course. *Staff*

#### **For Juniors, Seniors, and Graduates**

**202S. Narrative Writing. (AL)** The writing of short stories, memoirs, tales, and other narrations. Readings from ancient and modern narrative. Close discussion of frequent submissions by class members. Consent of instructor required. One course. *Porter or Price*

**203S. Advanced Narrative Writing. (AL)** The writing of extended narrative prose—long stories, novellas, substantive memoirs. Students should be proficient in the writing of short narratives. Consent of instructor required. One course. *Porter or Price*

**205. Semiotics and Linguistics. (SS)** See C-L: Russian 205; also C-L: Linguistics. One course. *Andrews*

**206. Semiotics of Culture. (AL, CZ)** See C-L: Russian 202; also C-L: Cultural Anthropology 202. One course. *Andrews*

**208. History of the English Language. (SS)** Introductory survey of the changes in sounds, forms, and vocabulary of the English language from its beginning to the present, with emphasis on the evolution of the language as a medium of literary expression. Not open to students who have taken English 112. C-L: Linguistics and Medieval and Renaissance Studies. One course. *Butters or Tetel*

**290. Methods of Composition Pedagogy. (SS)** A philosophical and practical exploration of developments in the field of composition studies. Cognition, concept formation, psycholinguistics, interpretation, and the making of meaning. Works by Burke, Richards, Kitzhaber, Berlin, Berthoff, Bizzell, Elbow, Corbett, Macrorie, Williams, Coles, and others. One course. *Gopen or Hillard*

#### **INTRODUCTION TO LITERATURE**

**20. Literature and Composition.** Credit for Advanced Placement on the basis of the College Board examination in literature and composition. One course.

**26S. Studies in Literary Topics. (AL)** May be taken twice. One course. *Staff*

**48B, S. Focus Program Seminar on Literature. (AL)** Topics vary each semester offered. One course. *Staff*

**49B, S. First-Year Seminar on Literature. (AL)** Topics vary each semester offered. One course. *Staff*

**51, 52. Representative American Writers. (AL)** Selections and complete works. 51: Poe, Emerson or Thoreau, Hawthorne, Melville, Whitman, Dickinson, and Twain; not open to students who have taken English 152 or 153. 52: James, Frost or Robinson, Crane or Dreiser, O'Neill, Faulkner, Hemingway, and others. Not open to students who have taken English 153 or 154. One course each. *Staff*

**90. Reading Critically: Poetry, Fiction, Drama. (AL)** An introduction to the skills of critical reading and the vocabulary of critical analysis by close examination of poetry, fiction, and

drama from a range of historical periods. A handbook or comparable guide to critical terms will be assigned. One course. *Staff*

**90S. Reading Critically: Poetry, Fiction, Drama. (AL)** A seminar version of English 90. One course. *Staff*

**91. Reading Critically: Chaucer, Shakespeare, Milton, Pope. (AL)** An introduction to the skills of critical reading and the vocabulary of critical analysis by close examination of the works of Chaucer, Shakespeare (or occasionally Spenser), Milton, and Pope. Focus on the acquisition of critical skills through analyzing the works of authors closely linked with the making of the dominant traditions of English poetry. A handbook or comparable guide to critical terms will be assigned. One course. *Staff*

**94. The Theater. (AL)** Not open to students who have taken Drama 51. See C-L: Drama 91. One course. *Clum or Riddell*

## **BRITISH LITERATURE**

**121A. Medieval English Literature to 1500. (AL)** The principal forms and examples of English prose, poetry, and drama of the Anglo-Saxon and Middle English periods (excluding Chaucer). In translation. C-L: Medieval and Renaissance Studies. One course. *Aers*

**121B. Sixteenth-Century English Literature. (AL)** Emphasis in poetry on Wyatt, Sidney, Spenser, Raleigh, and Shakespeare; in prose on Sidney and Sir Thomas More; in drama on Marlowe. C-L: Medieval and Renaissance Studies. One course. *DeNeef, Fish, Randall, or Shannon*

**123A. English Literature: 1600 to 1660. (AL)** Emphasis in poetry on Jonson and the cavaliers, Donne and the metaphysicals; in drama on Jonson, Tourneur, Webster, and Ford; in prose on character writers, Bacon, Burton, Donne, and Browne. C-L: Medieval and Renaissance Studies. One course. *DeNeef, Fish, Goldberg, or Randall*

**123B. English Literature: 1660 to 1800. (AL)** Major genres and authors such as Dryden, Congreve, Addison, Swift, Pope, Gray, Johnson, Blake, and Defoe or Fielding. One course. *Jackson or Thorn*

**125. English Literature of the Romantic Period. (AL)** Wordsworth, Coleridge, Byron, Shelley, Keats. One course. *Applewhite, Gleckner, Jackson, or Pfau*

**126. English Literature: 1832 to 1900. (AL)** Major writers and genres, with special emphasis on the Brontës, Dickens, Hardy, Tennyson, Carlyle, Browning, Arnold, and Ruskin. One course. *Ryals or Sedgwick*

**127. British Literature: 1900 to 1945. (AL)** Principal writers of fiction, drama, and poetry such as Yeats, Conrad, Shaw, Joyce, Lawrence, Woolf, Eliot, Auden, and others. One course. *Moses, Pope, or Torgovnick*

**128. Special Topics in British Literature since 1945. (AL)** One course. *Staff*

**129A, S. The Comedies of Shakespeare. (AL)** C-L: Drama 108S. One course. *Randall*

**129B, S. The Tragedies of Shakespeare. (AL)** C-L: Drama 109S. One course. *Randall*

**131. Studies in a Single British Author. (AL)** One course. *Staff*

**132C, S. Topics in Renaissance British Literature. (AL)** (Taught in the Oxford Summer Program.) Two courses. *Staff*

**132E, S. Topics in Nineteenth-Century British Literature. (AL)** (Taught in the Oxford Summer Program.) Two courses. *Staff*

**132G. S. Topics in Twentieth-Century British Literature. (AL)** (Taught in the Oxford Summer Program.) Two courses. *Staff*

**133. British Drama: Wilde to the Present. (AL)** See C-L: Drama 105. One course. *Blackadder or Clum*

**135. British Poetry of the Twentieth Century. (AL)** Changes in poetry and its criticism from the Edwardians. Yeats, Housman, Lawrence, Owen, the Sitwells, Graves, Auden, MacNeice, Dylan Thomas, Hughes, and Larkin. One course. *Moses, Pope, or Torgovnick*

**136. Eighteenth-Century British Novel. (AL)** Defoe, Richardson, Fielding, Smollett, and Sterne; the Gothic novel. One course. *Jackson or Thorn*

**137. Nineteenth-Century British Novel. (AL)** Scott, Austen, Dickens, Thackeray, Trollope, the Brontës, George Eliot, Meredith, Butler, Hardy, and others. Not open to students who have taken English 132A. One course. *A. Davidson, Moses, Ryals, Sedgwick, or Torgovnick*

**138. Twentieth-Century British Novel. (AL)** Conrad, Lawrence, Forster, Joyce, Woolf, Huxley, Cary, Amis, and Golding. Not open to students who have taken English 132B. One course. *A. Davidson, Moses, Pope, or Torgovnick*

**139S. Special Topics in British Literature. (AL)**

A. Can be counted as a pre-1800 British literature course for the English major requirements.

B. Can be counted as a pre-1900 British literature course for the English major requirements but not as a pre-1800 British literature course.

C. Does not count toward the pre-1800 or pre-1900 British literature English major requirements.

One course. *Staff*

## Major Authors

**140, 141. Chaucer. (AL)** 140: first two-thirds of his career, especially *Troilus and Criseyde*. 141: *The Canterbury Tales*. C-L: Medieval and Renaissance Studies. One course each. *Aers, Beckwith, DeNeef, or Gopen*

**143, 144. Shakespeare. (AL)** 143: twelve plays before 1600. 144: usually ten plays after 1600. Not open to students who have taken Drama 115, 116. C-L: Drama 182, 183. One course each. *DeNeef, Goldberg, Gopen, Jones, Porter, Randall, or Shannon*

**145. Milton. (AL)** Poetry and its literary and social background. C-L: Medieval and Renaissance Studies. One course. *Fish, Goldberg, or Price*

## For Juniors, Seniors, and Graduates

**212. Middle English Literature: 1100 to 1500. (AL)** Selected topics. C-L: Medieval and Renaissance Studies. One course. *Aers or Beckwith*

**213, 214. Chaucer. (AL)** 213: first two-thirds of his career, especially *Troilus and Criseyde*. 214: *The Canterbury Tales*. C-L: Medieval and Renaissance Studies. One course each. *Aers or Beckwith*

**220. Shakespeare: Selected Topics. (AL)** One course. *Goldberg or Porter*

**221. Renaissance Prose and Poetry: 1500 to 1660. (AL)** Selected topics. C-L: Medieval and Renaissance Studies. One course. *DeNeef, Fish, Goldberg, Randall, or Shannon*

**235. Restoration and Eighteenth-Century Literature: 1660 to 1800. (AL)** Selected topics. One course. *Jackson or Thorn*

**241. Romantic Literature: 1790 to 1830. (AL)** Selected topics. One course. *Applewhite, Gleckner, Jackson, or Pfau*

**245. Victorian Literature: 1830 to 1900. (AL)** Selected topics. One course. *Ryals or Sedgwick*

**251. British Literature since 1900. (AL)** Selected topics. One course. *Lentricchia, Moses, or Torgovnick*

## AMERICAN LITERATURE

**152. American Literature: 1820 to 1860. (AL)** Prose and poetry of American romanticism: Emerson, Thoreau, Hawthorne, Poe, Melville, and Whitman. Not open to students who have taken English 51. One course. *C. Davidson, Jones, Moon, Strandberg, Tompkins, or K. Williams*

**153. American Literature: 1860 to 1915. (AL)** Dickinson, Twain, James, the social and philosophical essayists, Crane, Dreiser, Robinson, and Frost. Not open to students who have taken English 52. One course. *C. Davidson, Jones, Moon, or K. Williams*

**154. American Literature: 1915 to 1960. (AL)** Eliot, Fitzgerald, Hemingway, Faulkner, and others. Not open to students who have taken English 52. One course. *Clum, Ferraro, Lentricchia, Moon, Moses, Pope, or Strandberg*

**155. Contemporary American Writers. (AL)** Novelists and poets prominent since 1960. One course. *Clum, C. Davidson, Ferraro, Moses, Strandberg, or Torgovnick*

**159. Modern Southern Writers. (AL)** Writers who came to maturity following World War I, and their successors: Faulkner, Wolfe, Porter, Tate, Warren, Welty, Taylor, Percy, O'Connor, Dickey, Hurston, Walker, and others. Works analyzed in the historical and cultural context of the region. One course. *Applewhite*

**161. Studies in a Single American Author. (AL)** One course. *Staff*

**162. American Drama: O'Neill to the Present. (AL)** See C-L: Drama 104. One course. *Clum*

**164A, 164B. African-American Literature. (AL)** 164A: oral and literary traditions from the American colonial period into the nineteenth century, including spiritual as lyric poetry and the slave narrative as autobiography. 164B: the late nineteenth century to contemporary writers. Not open to students who have taken the former English 167, 168. C-L: African and African-American Studies 173, 174. One course each. *Chandler, Clarke, or Holloway*

**165, A-E. Studies in an Individual African-American Author. (AL)**

A. James Baldwin

B. W. E. B. DuBois

C. Ralph Ellison

E. Toni Morrison

C-L: African and African-American Studies 181.

One course. *Chandler, Clarke, Holloway, or Willis*

**166, A-F. African-American Literary Genres. (AL)**

A. Autobiography

B. Drama

C. Poetry

E. The Novel

F. The Essay

C-L: African and African-American Studies 182.

One course. *Chandler, Clarke, Holloway, or Willis*

**167. Special Topics in Contemporary Black Literatures. (AL)** One course. *Chandler, Clarke, Holloway, or Willis*



**168S. Seminar in African-American Literary Studies. (AL)** Topics may change each semester. Prerequisite: English 164A or 164B. One course. *Chandler, Clarke, Holloway, or Willis*

**169S. Special Topics in American Literature. (AL)** One course. *Staff*

#### **For Juniors, Seniors, and Graduates**

**263. American Literature to 1865. (AL)** Selected topics. One course. *C. Davidson, Jones, Moon, or Tompkins*

**267. American Literature: 1865 to 1915. (AL)** Selected topics. One course. *C. Davidson, Moon, Tompkins, or K. Williams*

**269. American Women Writers. (AL)** Selected topics. C-L: Women's Studies. One course. *C. Davidson, Pope, or Tompkins*

**275. American Literature since 1915. (AL)** Selected topics. One course. *Ferraro, Lentricchia, Pope, Strandberg, or Torgovnick*

#### **GENRE, CRITICISM, AND WORLD LITERATURE**

**170. Special Topics in Genre. (AL)** One course. *Staff*

**172. Literary Theory. (AL)** Major works and theoretical issues in the history of literary criticism. One course. *Staff*

**174A. Classical to Neoclassical. (AL)** See C-L: Drama 102. One course. *Blackadder or Clum*

**174B. Toward and Beyond Realism. (AL)** See C-L: Drama 103. One course. *Blackadder or Clum*

**175. Literary Approaches to the Bible. (AL)** Selected books of both Testaments, emphasizing narrative strategies, literary contexts, and Biblical genres: primeval myth, patriarchal history, prophecy, and apocalyptic. One course. *Staff*

**176B, S. Theater in London: Text. (AL)** Drama in performance from the Greeks to the present based on performances offered by the Royal Shakespeare Company, Royal National Theatre, and other theaters in London. Twenty plays will be seen and studied. (London summer program.) Not open to students who have taken the former Drama 149S. C-L: Drama 117S. One course. *Clum*

**176C, S. Theater in London: Performance. (AL)** The stages of realization of a play or musical from the script to the production, focusing on productions in London. Aspects of theatrical performance through scene work, discussions, and workshops with British theater practitioners, observation of theater at work, and supervised projects. (London summer program.) Not open to students who have taken the former Drama 148S. C-L: Drama 138S. One course. *Clum*

**177. Third World and Postcolonial Fiction. (AL)** Comparative study of representative contemporary fiction from Africa, India, the Middle East, Australia, New Zealand, Latin America, and the Caribbean, each within its appropriate cultural, historical, and political context. All readings in English. One course. *Moses or Torgovnick*

**178. Literature and the Other Arts. (AL)** Selected topics in the study of the interrelation of literature and other art forms, such as music and painting. One course. *Staff*

**179S. Special Topics in a Literary Genre. (AL)** One course. *Staff*

**184. Literature and Sexualities. (AL)** American and British representations of sexual identities and same-sex desire, ranging from the proliferation of homo/heterosexual discourses in the late nineteenth century to literature about AIDS in contemporary mass

media. Whitman, Wilde, Stein, Hall, Forster, Lorde, Moraga, Watney, and others. C-L: Study of Sexualities. One course. *Clum, Goldberg, or Moon*

**186A, S. Canadian Literature in English. (AL)** Eighteenth century to the present. Emphasis on the twentieth century and on novels by Hugh MacLennan, Margaret Laurence, Mordecai Richler, Margaret Atwood, Rudy Wiebe, and others. C-L: Canadian Studies and Comparative Area Studies. One course. *A. Davidson*

### **For Juniors, Seniors, and Graduates**

**281. Studies in Genre. (AL)** History, criticism, and theory of literary genres such as the novel, pastoral, epic, and drama. One course. *Staff*

**288. Special Topics. (AL)** Subjects, areas, or themes that cut across historical eras, several national literatures, or genres. One course. *Staff*

**289. The Theory of the Novel. (AL)** Major issues in the history and theory of the novel. One course. *Moses or Torgovnick*

### **CULTURAL STUDIES**

**28S. Studies in Film and Video. (AL)** May be taken twice. C-L: Film and Video. One course. *Staff*

**101A. Introduction to Film. (AL)** Basic film theory and history of motion picture technology. Introduction to experimental, documentary, and narrative forms of Third World, European, and United States cinemas. Economics and aesthetics. Not open to students who have taken Drama 132. C-L: Drama 173, Film and Video 130, and Literature 110. One course. *Gaines, Radway, Surin, Tompkins, Torgovnick, or Willis*

**101B. Introduction to Cultural Studies. (AL)** Basic theoretical approaches to high and low culture—Bourdieu and Adorno, the Frankfurt School and the Birmingham Center for Contemporary Cultural Studies; Third World and feminist approaches; the avant-garde and subcultural resistance. Analysis of sport and leisure, film and photography, law and the arts, popular and classical music, painting and advertising imagery. C-L: Film and Video, Literature 100, and Perspectives on Marxism and Society. One course. *Gaines, Radway, Surin, Tompkins, Torgovnick, or Willis*

**101C, S. Documentary Film/Video Theory and Practice. (AL)** Prerequisite: Drama 173, English 101A, Literature 110, or Literature 111S. See C-L: Film and Video 104S; also C-L: Cultural Anthropology 131S. One course. *Staff*

**101D, D. Perspectives in Gay, Lesbian, and Bisexual Studies. (CZ)** See C-L: Study of Sexualities 115D. One course. *Younger*

**120. Advertising and Society: Global Perspective. (SS)** See C-L: Cultural Anthropology 110; also C-L: Canadian Studies, Comparative Area Studies, Film and Video, Linguistics, Sociology 160, and Women's Studies. One course. *Luttrell, O'Barr, or Wilson*

**122. Studies in Comparative World Cinema. (AL)** See C-L: Literature 113; also C-L: Film and Video, German 113, and Russian 113. One course. *Staff*

**124. Sexualities in Film and Video. (AL)** See C-L: Literature 115; also C-L: Film and Video. One course. *Clum, Gaines, or Moon*

**156. History of Mass Culture in the United States. (AL)** The formation of American popular culture in different historical periods. Cultural forms including music, movies, fashion, and leisure. C-L: Film and Video and Literature 140. One course. *Gaines, Radway, Tompkins, Torgovnick, or Willis*

**157, 158. American Literature and Culture. (AL)** Relationship of literature to the other arts, American intellectual history, religion, science, technology, and architecture. 157: to the Civil War. 158: from the Civil War to 1960. One course each. *K. Williams*

**171. Doing Documentary Work. (AL, SS)** See C-L: Public Policy Studies 178; also C-L: Visual Arts 178, and History 150C. One course. *Coles and Harris*

**183S. Film and Video Theory and Practice. (AL)** Prerequisite: Drama 173, English 101A, Literature 110, or Literature 114. See C-L: Film and Video 100S; also C-L: Drama 142S. One course. *Burns*

**185. Studies in Film History. (AL)** Close examination of a particular issue, period, national cinema, or technological development. C-L: Drama 174, Film and Video, and Literature 116. One course. *Clum, Gaines, or Jameson*

**189S. Special Topics in Film. (AL)** A major genre, period, or director. Not open to students who have taken the former Drama 197S. Prerequisite: Drama 173 or English 101A. C-L: Drama 178S and Film and Video. One course. *Clum, Gaines, or Moses*

**190. Television, Technology, and Culture. (AL)** Television criticism and its relation to film theory. Mainstream television genres, the historical avant-garde, and video art. History of the technology and cross-cultural comparison of television programming. Prerequisite: Drama 173, English 101A, or Literature 114. C-L: Film and Video and Literature 119. One course. *Gaines*

#### For Juniors, Seniors, and Graduates

**284. Contemporary Film Theory. (AL)** Post-1968 film theory—Brechtian aesthetics, cinema semiotics, psychoanalytic film theory, technology, feminist theory, and Third World cinema. C-L: Film and Video. One course. *Gaines*

#### INDEPENDENT STUDY

**191, 192, 193, 194. Independent Study.** Directed reading and research. Consent of both the instructor and the director of undergraduate studies required. Half or one course each. Variable credit. *Staff*

**195T. Tutorial.** Directed reading and research. Students should consult the director of undergraduate studies as early as possible in the preceding term. One course. *Staff*

#### DISTINCTION SEMINARS

**197A, 198A, S. Distinction Program Sequence.** Open to those whose thesis will be a critical paper or piece of other research (for example, in linguistics). Consent of instructor required. One course each. *Staff*

**197B, 198B, S. Distinction Program Sequence.** Open to those whose thesis will be in the field of creative writing. Consent of instructor required. One course each. *Staff*

#### COURSES CURRENTLY UNSCHEDULED

**50S. American Literature Walkabout.**

**92. British Literature 1750-1950. (AL)**

**113A. Introduction to Old English. (AL)**

**113B. Old English Literature. (AL)**

**130. Shakespeare and the Theater. (AL)**

**132B. Atmosphere and Mystery in Twentieth-Century English Fiction. (AL)**

**151. American Literature to 1820. (AL)**

**163. Twentieth-Century American Poetry. (AL)**

- 182. American Film Genres. (AL)
- 186B. S. Canadian Theater. (AL)
- 187. Melodrama and Soap Opera. (AL)
- 188. Narrative Film and the Novel. (AL)
- 207A. Introduction to Old English. (AL)
- 207B. Old English Literature. (AL)
- 209. Present-Day English. (SS)
- 222. Reading Milton. (AL)
- 225. Renaissance Drama: 1500 to 1642. (AL)
- 285. Major Texts in the History of Literary Criticism. (AL)

## THE MAJOR

*Basic Requirement.* One course from the following list of introductory courses: English 90, 90S, or 91. Except by written permission of the director of undergraduate studies, the course must be taken in the first term after the major has been declared (unless it has been taken earlier). It may be taken concurrently with advanced courses.

*Major Requirements.* Nine or more courses at the 100 or 200 level from the department's offerings which consist of courses (including independent studies, tutorials, and seminars) in: writing and language; British literature; American literature; genre, criticism, and world literature; and cultural studies. These are to be organized into a coherent plan of study approved by the student's advisor. The courses must include: (a) one of the following major author courses Chaucer (140,141, 213, 214), Shakespeare (143,144, 220), or Milton (145, 222); (b) two additional courses in British literature before 1900 (including at least one before 1800); one 100-level seminar (which may be satisfied in [b]).

*Recommendations.* Students planning to enter graduate study in an English department should take additional courses from the early as well as later and modern periods. If eligible, they should also apply for the Distinction Program. Aspiring graduate students should consult both their advisor and the chair of the department's Committee on Pregraduate School Advising.

## THE MINOR

*Requirements.* Five courses, four of which must be at or above the 100 level and none of which may be in the English 20S series. One of these courses must be a seminar, and only one transfer credit and no Advanced Placement credits may count toward the minor.

## Foreign Languages

The department recommends that students majoring in English complete at least two years of college-level study, or the equivalent, of a foreign language. Students contemplating graduate work in English should note that many master's programs require examination in one foreign language and that doctoral programs commonly require examination in two. Students interested in linguistics are strongly urged to study at least one non-Indo-European language.

## Teacher Certification

Each year a number of Duke English majors earn certificates as secondary school teachers. While licensed by the state of North Carolina, these majors are essentially certified for other states as well. Also, such training is urged for those who consider teaching in independent schools, since most private or parochial schools would prefer candidates who have earned teaching certificates.

Such certification may be gained as part of the English major and is not as time-consuming as is sometimes believed. Candidates should have a solid background in both American and British literature; also helpful are courses in composition and cultural studies. Among the requirements are one course in linguistics (English 111,112,115,119, 205, 208, or 209), an appropriate course in psychology, and several courses in education.



The last semester of the senior year is devoted to the student-teaching block, including two special, accelerated courses and ten weeks of full-time teaching and observation in the schools, working with a mentor-teacher and with Duke faculty. This experience leads to an English-teaching certificate to accompany the bachelor's degree.

Anyone considering secondary school English teaching should confer with the director of secondary school teacher preparation in the Program in Education as soon as possible.

### Graduation with Distinction

The graduation with distinction program is designed for the department's most serious students, whose coursework and achievements have prepared them for a sustained and significant writing project. The program consists of two seminars—English 197S and 198S—taken in the fall and spring semesters of the senior year. Please note: These seminars may not be counted among the courses required for completion of the major.

The fall seminar provides a weekly forum for discussion of thesis topics, research and organization, and good writing. By the end of the term, students are expected to have the thesis well underway; permission to proceed to English 198S will depend on the student's progress during the fall semester. In the spring, students will work independently, for the most part, to complete the thesis; there will be some seminar meetings, as well as regular conferences with the program director and individual faculty advisors.

The distinction thesis is expected to be an especially well-informed and well-written piece of literary criticism or other research (e.g. linguistics). The creative writing option involves similar expectations: that is, not only good writing but a mature and well-read grasp of the field. The critical or research thesis is generally at least seventy-five pages. In creative writing, approximate guidelines are a full-length play, seventy pages of prose fiction, or thirty pages of poetry.

The thesis must be submitted before the end of the second term of the senior year to qualify for distinction. The department's honors committee composed of three faculty members will evaluate the theses and award distinction. A student who has done satisfactory work in the seminars but whose thesis is denied distinction will receive graded credit only for English 197S and English 198S. Theses awarded distinction will be bound and deposited in Perkins Library.

Students interested in the distinction program must apply to the department's honors committee by **February 15 of the junior year**. Application materials are available from and should be returned to 304H Allen Building. Applicants must have completed—by the beginning of the senior year—at least five 100-level courses in English and must have a minimum 3.5 average in their English courses. In addition, they must submit a writing sample and two recommendations from members of the faculty.

### Environment (Nicholas School)

The professional school courses listed below are described fully in the *Bulletin of Duke University: Nicholas School of the Environment*. They are open to undergraduates by consent of the instructor; they do not count for area of knowledge distribution requirements.

Students who are preparing for professional careers in natural resources and the environment should refer to the section on undergraduate-professional combination programs and the Environmental Sciences and Policy Program section in this bulletin.

200. Integrated Case Studies. Variable credit. *Staff*

201. Forest Resources Field Skills. Half course. *Richter*

204. Forest Vegetation Measurement. One course. *Staff*

205. Ecological Management of Forest Systems (Silviculture). One course. *Oren*

205L. Ecological Management of Forest Systems (Silviculture). One course. *Oren*

207. Forest Pest Management. One course. *Stambaugh*

207L. Forest Pest Management. One course. *Stambaugh*

- 208L. Estuarine Ecosystem Processes. Prerequisite: ecology, systematics, or field biology course or consent of instructor. C-L: Marine Sciences. One course. *Kirby-Smith*
209. Conservation Biology and Policy. Prerequisites: introductory biology; suggested: a policy and/or introductory ecology course. C-L: Marine Sciences. One course. *Crowder and Rubenstein*
212. Environmental Toxicology. Prerequisites: organic chemistry and vertebrate physiology or consent of instructor. One course. *Di Giulio*
213. Forest Ecosystems. One course. *Richter*
215. Environmental Plant Physiology. One course. *Oren*
216. Applied Population Ecology. Prerequisites: introductory statistics, calculus, and computer programming or consent of instructor. One course. *Staff*
217. Tropical Ecology. Prerequisite: a course in general ecology. C-L: Biology 215, Botany 215, and Zoology 215. One course. *Terborgh*
- 218L. Barrier Island Ecology. Prerequisite: Biology 25L or equivalent; suggested: course in botany or ecology. C-L: Biology 218L, Botany 218L, and Marine Sciences. One course. *Evans, Peterson, and Wells (visiting summer faculty)*
221. Soil Resources. One course. *Richter*
- 225L. Coastal Ecotoxicology and Pollution. Prerequisites: introductory chemistry and biology. C-L: Marine Sciences. One course. *Kenney*
- 230L. Weather and Climate. One course. *Knoerr*
232. Microclimatology. C-L: Biology 232 and Botany 232. One course. *Knoerr*
- 234L. Watershed Hydrology. One course. *Katul*
235. Air Quality Management. One course. *Vandenberg*
236. Water Quality Management. One course. *Stow*
- 237L. Field Botany of North Carolina's Wetlands. Prerequisite: one course in plant diversity or systematics, or consent of instructor. C-L: Biology 242L and Botany 242L. One course. *Shaw and Wilbur*
239. Human Health and Ecological Risk Assessment. One course. *Mihaich and Vandenberg*
240. Fate of Organic Chemicals in the Aquatic Environment. Prerequisites: university-level general chemistry and organic chemistry within last four years. C-L: Civil Engineering 240. One course. *Dubay*
241. Atmospheric Chemistry and Air Pollution. Prerequisites: university-level general chemistry and organic chemistry within last four years. C-L: Civil Engineering 241. One course. *Staff*
242. Environmental Aquatic Chemistry. Prerequisite: university-level general chemistry within last four years. C-L: Civil Engineering 242. One course. *Ahmann*
243. Environmental Biochemistry. Prerequisite: organic chemistry. C-L: Cell Biology 243 and Marine Sciences. One course. *C. Bonaventura*
- 244L. Molecular and Cellular Processes in Marine Organisms. Prerequisite: organic chemistry. C-L: Cell Biology 244L and Marine Sciences. One course. *C. Bonaventura and McClellan-Green*
245. Ecology of Microorganisms. One course. *Staff*
246. Survey of Occupational Health and Safety. One course. *Staff*
247. Survey of Environmental Health and Safety. One course. *Staff*
248. Solid Waste Engineering. Prerequisite: Civil Engineering 124L or consent of instructor. C-L: Civil Engineering 248. One course. *Vesilind*
249. Environmental Molecular Biology. Prerequisite: introductory biology. One course. *Freedman*
- 250L. Form, Function, and Adaptation of Plants. Prerequisite: Biology 25L; suggested: either Biology 110L, 140L, 149, or 152. C-L: Biology 250L and Botany 250L. One course. *Sperry*
251. Statistics and Data Analysis in Biological Science. C-L: Statistics 210B. One course. *Staff*
255. Applied Regression Analysis. Prerequisite: Statistics 210B or equivalent. C-L: Statistics 242. One course. *Staff*
- 256S. Seminar in Ocean Sciences. C-L: Marine Sciences. Half course. *Staff*
263. Environmental Economics: Quantitative Methods and Applications. Prerequisite: Economics 149. C-L: Economics 263. One course. *Smith*
264. Applied Differential Equations in Environmental Sciences. Prerequisite: Mathematics 31 or equivalent or consent of instructor. Half course. *Katul*
- 269S. Advanced Topics in Marine Ecology. C-L: Marine Sciences and Zoology 264S. Half course. *Crowder*
270. Resource and Environmental Economics. Prerequisite: introductory course in microeconomics. C-L: Economics 270 and Public Policy Studies 272. One course. *Kramer*

271. **Economic Analysis of Resource and Environmental Policies.** Prerequisite: Environment 270 or equivalent; Economics 149 recommended. C-L: Economics 272. One course. *Mansfield*
272. **Evaluation of Public Expenditures.** C-L: Economics 261 and Public Policy Studies 261. One course. *Conrad*
273. **Marine Fisheries Policy.** C-L: Marine Sciences. One course. *Orbach*
274. **Resource and Environmental Policy.** C-L: Public Policy Studies 274. One course. *Staff*
276. **Marine Policy.** C-L: Marine Sciences and Public Policy Studies 197. One course. *Orbach*
277. **Conservation and Sustainable Development I: Concepts and Methods.** C-L: Latin American Studies. One course. *Staff*
278. **Conservation and Sustainable Development II: Integrated Problem Solving.** C-L: Latin American Studies. One course. *Staff*
280. **Social Science Surveys for Environmental Management.** Prerequisite: Environment 251 or equivalent. One course. *Kramer*
- 282S. **Environmental Ethics.** C-L: Philosophy 289S. One course. *Cooper*
285. **Land Use Principles and Policy.** C-L: Public Policy Studies 285. One course. *Healy*
290. **Physical Oceanography.** Prerequisites: Mathematics 31 and 32 or consent of instructor. C-L: Earth and Ocean Sciences 203 and Mechanical Engineering 290. One course. *Lozier*
291. **Geological Oceanography.** C-L: Earth and Ocean Sciences 205 and Marine Sciences. One course. *Staff*
298. **Special Topics.** One-half or one course. *Staff*

#### COURSES CURRENTLY UNSCHEDULED

- 222L. **Physical Processes in Coastal Environments.**
- 252L. **Statistics and Data Analysis in Earth and Ocean Science.**
- 267S. **Conservation Biology of Marine Mammals.**
268. **Advanced Topics in Nearshore Processes.**

## Environmental Sciences and Policy Program

Assistant Professor of the Practice Miranda, *Director of Undergraduate Programs*

A major is available in this program.

The undergraduate major in environmental sciences and policy is offered within the Bachelor of Arts degree to students interested in the interdisciplinary study of environmental issues. The major permits students to combine studies in the natural sciences and engineering with courses in social sciences and humanities around general focus areas and themes. This major is specifically designed for students with career objectives such as environmental law, policy, science, management, or planning that require in-depth understanding of environmental issues that cross traditional disciplinary boundaries.

The major is housed within and administered by the Nicholas School of the Environment. Elective courses for the major are taught by more than sixty Duke professors in twenty cooperating departments and schools. The prerequisites for this major stress a firm foundation in basic natural and social science areas. An introductory core course focuses on local, regional, and global case studies taught by interdisciplinary teams of faculty. Upper-level courses are selected in consultation with advisors to match a specific environmental theme or career objective. The upper-level curriculum includes a course in probability and statistics, an upper-level seminar, and an independent study, internship, or field experience. At least two courses in the upper-level curriculum must be selected from approved lists in each of the social sciences/humanities and sciences/engineering. The program is administered by its director and an advisory committee representing the various areas and cooperating departments.

**Advising.** Advisors are assigned based on students' general areas of interest. Students present a proposed plan of study to their advisors that emphasizes the connections among their courses. The program encourages close relationships between faculty and students with convergent interests.



*Independent Study, Internship, or Field Experience.* All students in the program complete either an independent study, internship, or a field experience related to their proposed course of study. The director's office, in collaboration with Duke's Career Development and Counseling Office, maintains a file of available internships. Field experiences may include a semester or summer session at the Duke University Marine Laboratory, one of several approved study abroad programs, or studies at over thirty field laboratories.

## ENVIRONMENTAL SCIENCES AND POLICY COURSES (ENV)

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**101. Introduction to Environmental Sciences and Policy.** (SS) Application of basic principles of natural science, environmental economics and policy, engineering, and ethics to local, regional, and global environmental issues. Not open to first-year students. One course. *Kramer or Miranda*

**105. Global Environmental Geography.** (NS) Global spatial patterns of natural phenomena and the human modification of those patterns. Introduction to earth/sun relations, climatology, biogeography, and geomorphology. One course. *Staff*

**121. Climate Change: A Global Perspective.** (NS) Introduction to the scientific basis for prediction of global environmental change with emphasis on change in surface temperature, sea level, precipitation, and tropical cyclone activity. (Given at Bermuda.) Prerequisite: one year of chemistry. C-L: Marine Sciences. One course. *Malmquist and Murnane*

**122S. Climate-Related Hazards and Humanity.** (NS) The roles of science, politics, and business in quantifying and managing risks associated with climate-related hazards such as hurricanes. (Given at Bermuda.) C-L: Marine Sciences. Half course. *Malmquist*

**125. Remote Sensing and Long-term Environmental Monitoring.** (NS) Introduction to the theory and practice of environmental monitoring. Ocean biogeochemical cycles, tropical ecosystems, monitoring, and air and water pollution impact assessment and monitoring. (Given at Bermuda.) C-L: Marine Sciences. One course. *Nelson*

**126S. Field Methods in Earth and Environmental Sciences.** (NS) Open only to juniors and seniors. See C-L: Earth and Ocean Sciences 126S. One course. *Klein*

**129. Environmental Science and Policy of the Tropics.** (SS, NS) Investigates major environmental issues facing tropical nations using concepts from the natural and physical sciences, the social sciences, and resource management. Topics include: climatic and biogeographical patterns, trends in human population size and demography, historical and contemporary issues in resource use and conservation, and sociological and ethical concerns regarding the source and distribution of economic wealth. (Given in Costa Rica.) Prerequisite: introductory biology. One course. *Shelly*

**132S. Current Topics in Oceanography and Marine Biology.** (NS) Topics such as the Iron Hypothesis, toxic algal blooms, and UV light considered through readings in the primary literature and student presentations. (Given at Bermuda.) Prerequisite: introductory biology. C-L: Marine Sciences. Half course. *Staff*

**133S. Molecular Approaches to Questions of Physiology, Ecology, and Evolution in the Marine Environment.** (NS) (Given at Bermuda.) Prerequisite: introductory biology. C-L: Marine Sciences. Half course. *Trapido-Rosenthal*

**134L. Biological Cycles in the Ocean.** (NS) Biogeochemistry of carbon and nitrogen in the marine environment and associated laboratory techniques. Includes laboratory. (Given at Bermuda.) Prerequisites: introductory biology and introductory chemistry. C-L: Marine Sciences. One course. *Bates and Carlson*



**140. A Scientist's Perspective on Environmental Principles, Policy, and Legislation.** (SS, NS) Bermuda's ecological, economic, sociopolitical systems, and environmental legislation as both a case study and as a comparative microcosm. Topics include: ecosystem conservation, natural resource management, pollution and waste management, and energy conservation and management. (Given at Bermuda.) C-L: Marine Sciences. One course. *Bates and Connelly*

**149. United States Environmental Policy.** (SS) See C-L: Public Policy Studies 149. One course. *Miranda or A. Rimer and L. Rimer*

**181, 182. Special Topics in Environmental Sciences and Policy.** Content to be determined each semester. Consent of instructor required. One course each. *Staff*

**191, 192. Independent Study.** Open to qualified juniors and seniors with consent of instructor and director of undergraduate studies. One course each. *Staff*

## THE MAJOR

*Corequisites.* The following courses or their equivalents (for example, Advanced Placement credit) are required. Approval to substitute courses taken at other universities must be obtained from the director of undergraduate studies in the department offering the course. Some of these courses are prerequisite to some upper-level courses in this major.

Biology 25L. Principles of Biology

Biology 31 or 32. Diversity of Life, or 140. Plant Diversity, or 176. Marine Invertebrate Zoology

Chemistry 11L and 12L. Principles of Chemistry

Economics 2D or 52D. Competition, Monopoly, and Welfare

Geology 41. Introduction to Geology

Mathematics 31 and 32. Introductory Calculus I and II

### *Major Requirements.*

1. *Introductory Core Course:* Environment 101.
2. *Environmental Policy.* One course from an approved list of environmental policy courses.  
Approved courses include:  
Public Policy Studies 107/Political Science 107. Comparative Environmental Policies  
Environment 149/Public Policy Studies 149. United States Environmental Policy  
Public Policy 147/Political Science 147. Environmental Politics and Policies in the Developing World  
Political Science 148/Public Policy Studies 143. Environmental Policies Beyond Borders  
Public Policy Studies 197/Environment 276. Marine Policy  
Environment 273. Marine Fisheries Policy
3. *Probability and Statistics.* One course from an approved list dealing with statistical inference and probability theory. Approved courses include:  
Economics 139. Introduction to Econometrics  
Environment 251. Statistics and Data Analysis in Biological Science  
Environment 252L. Statistics and Data Analysis in Earth and Ocean Science  
Political Science 138. Quantitative Political Analysis  
Psychology 117/Sociology 133. Statistical Methods  
Statistics 110A. Statistics and Data Analysis in the Social Sciences  
Statistics 110B. Statistics and Data Analysis in Economics

Statistics 110C. Statistics and Data Analysis in Public Policy and Sociology  
Statistics 110E. Statistics and Data Analysis in Psychology and Biological Sciences  
Statistics 112. Introduction to Applied Statistics  
Sociology 133. Statistical Methods

4. *Focused Study*. Six upper-level courses proposed by students in consultation with their advisors to fit a particular theme or career objective. At least two of these courses must be selected from approved lists in each of the social sciences/humanities and sciences/engineering. These lists are available from the director of undergraduate studies of the program. One course must be an upper-level seminar or small-group learning experience.
5. *Independent Study/Internship/Field Experience*. Students complete an approved independent study, internship, or field experience which may or may not include course credit toward upper-level requirements. A letter must be submitted to the director of undergraduate studies from the faculty member, advisor, or supervisor verifying completion of the requirement.

(Note: Courses in the major (excluding co-requisites) may count toward only two areas of knowledge for the general studies requirement of the Bachelor of Arts curriculum. Students may not use more than six professional school course credits toward the Bachelor of Arts degree. This six-course restriction applies to all courses offered through the Business School, the Divinity School, the Law School, the Medical School, the School of Engineering, and any courses at or above the 200-level in the Nicholas School of the Environment.)

*Graduation with Distinction*. The Environmental Sciences and Policy Program offers a graduation with distinction option. Interested students with a 3.0 grade point average overall and 3.2 grade point average in the Environmental Sciences and Policy major should apply by the end of their junior year. Participants write a 25-50 page paper describing their completed research; they are supervised by a faculty committee with a primary advisor and two additional faculty members. Students must also deliver an oral presentation of their completed research, which is evaluated by the faculty committee. For additional information or application forms, contact the director of undergraduate studies.

## Evolutionary Biology

See Biology.

## Film and Video (FV)

Associate Professor Gaines, *Director*

A certificate, but not a major, is available in this program.

The Program in Film and Video is an interdisciplinary course of study which introduces students to the critical analysis of communications technologies: film, photography, and television. Practical production experience is also available through course work and internships. Courses in this area are offered through seventeen different academic departments and programs and taught by thirty-three faculty members. The program also sponsors speakers, video art screenings, and exhibits in cooperation with the Center for Documentary Studies, the Institute of the Arts, the Center for International Studies, the University Art Museum, the Literature Program, Asian and African Languages and Literature, and the Mary Lou Williams Center for Black Culture. Visiting independent filmmakers are brought to campus under the auspices of the Film and Video Program in conjunction with Screen/Society and Freewater exhibitions.

To qualify for the certificate, students must take at least six courses: two core courses and any four related courses from the approved list published in this bulletin or from the listings posted each semester. English 101A (Introduction to Film) is a prerequisite for all Film and Video production courses.

For the certificate, students may take no more than three courses originating in a single department or program, other than those originating in the Film and Video Program. Literature majors on the Film/TV Studies track may count no more than two Film/TV Studies courses toward their Film and Video certificate. (See Literature Program for major requirements.)

## DUKE IN LOS ANGELES PROGRAM IN ARTS AND MEDIA

This interdisciplinary program offers students interested in the film, media, entertainment law, contemporary arts and music industries an intensive one-semester program in Los Angeles, based at the University of Southern California (USC). In addition to taking one required Duke seminar on the United States Culture Industries (Literature 197S), students enroll in an internship for credit (Institute of the Arts 105) and take two courses at USC in either its School of Cinema-TV or its Division of General Studies.

### Required courses:

Literature 197S: Special Topics in the United States Culture Industries

Film and Video 112S: Media Internship in Los Angeles

USC: two courses, one appropriate to the program and selected in consultation with the director, and one elective course.

This program is limited to juniors and seniors. Consult the program director for required prerequisites.

## CORE COURSES

### FILM AND VIDEO PROGRAM COURSES

**30S. Special Topics in TV Theory/TV Production.** (AL) A combination of television theory and video production exercises designed to think through the politics and aesthetics of new technologies. Prerequisite: Drama 173, English 101A, or Literature 110. One course. *Staff*

**100S. Film and Video Theory and Practice.** (AL) Film and video production in conjunction with comparative history and theory of these technologies. Students produce works in basic Super 8 mm, 16 mm, and small format video production. Prerequisite: Drama 173, English 101A, Literature 110, or Literature 114. C-L: Drama 142S and English 183S. One course. *Burns*

**101S. Special Topics in Advanced Film, Video, or Audio Production.** (AL) An in-depth investigation of a particular technology for students with demonstrated commitment and aptitude. Exploration of the theoretical assumptions behind the development of new technological arts of the twentieth century. Also offered as Literature 111S. Prerequisite: Drama 173, English 101A, or Literature 110. One course. *Staff*

**102S. Film Animation Production.** (AL) Experimentation with various media; mastering animation techniques such as metamorphosis, timing, articulation, storytelling, sound design, special effects, and camera. Each student to produce a one-minute animated film on the Oxberry 16mm film animation stand. C-L: Visual Arts 165S. One course. *Burns*

**103S. Theory and Practice of Sound Technology.** (AL) Technical basis and aesthetic motivation of sound recording and sound exploitation. Technical demonstration and student exercises explore the mechanics and dramatic and psychological implications of formats, microphone placement, mixing, acoustic signature, digital recording, double system, and sound editing, leading to an individually produced sound design for live action or animation film/video. Prerequisites: Drama 173, English 101A, Film and Video 101S, Literature 110, or Literature 111S. One course. *Staff*

**104S. Documentary Film/Video Theory and Practice.** (AL) The politics and aesthetics of realism. History of styles from Griersonian "propaganda" to cinema verite to "reality TV."

Practical exercises in location sound, camera to subject relationship, and camera movement. Prerequisite: Drama 173, English 101A, Literature 110, or Literature 111S. C-L: Cultural Anthropology 131S and English 101C. One course. *Staff*

**105S. American Communities: A Documentary Video Approach. (AL, SS)** A documentary approach to the study of local communities through video production projects assigned by the course instructor. Working closely with these groups, students explore issues or topics of concern to the community. Students will complete an edited video as their final project. Prerequisites: English 101A and any one of the following: Film and Video 100S, 101S, or 104S. C-L: Cultural Anthropology 134S, History 150B, Political Science 156S, and Public Policy Studies 105S. One course. *Staff*

**110S. Internship in Film and Video.** Students may arrange academic work in conjunction with approved internship in the entertainment industry. Academic work must be with core faculty and include the university minimum (one research paper) as well as reading from bibliography approved by professor and/or viewing list worked out in advance. One course. *Staff*

**111T. Tutorial. (AL)** One course. *Staff*

**112S. Media Internship in Los Angeles.** Immersion in the for-profit and not-for-profit art and entertainment worlds through apprenticeship to a sponsoring artist, scholar, or institution selected to match each student's area of interest. Each student required to submit a substantive paper containing significant analysis and interpretation that considers the relationship between the student's sponsoring institution and the larger industrial/cultural complex within the local (Los Angeles) and national economies of art, culture, and commerce. Simultaneous enrollment in Literature 197S required. Open only to students admitted to the Duke in Los Angeles Program. One course. *Staff*

**130. Introduction to Film. (AL)** Not open to students who have taken Drama 132. See C-L: English 101A; also C-L: Drama 173, and Literature 110. One course. *Gaines, Radway, Surin, Tompkins, Torgovnick, or Willis*

## CORE COURSES FROM OTHER PROGRAMS AND DEPARTMENTS

For descriptions of the courses below consult the listings under the specified departments in this bulletin.

English 101A. Introduction to Film. (Cross-listed.)

English 185. Studies in Film History. (Cross-listed.)

English 190. Television, Technology and Culture.

German 161. European Cinema in Conflict.

History 150A. Documentary Film History. (Cross-listed.)

Literature 112. Special Topics in National Cinema.

Literature 113. Studies in Comparative World Cinema. (Cross-listed.)

Literature 114. Film Theory.

Literature 115. Sexualities in Film and Video. (Cross-listed.)

Literature 116. Studies in Film History. (Cross-listed.)

Literature 117. Documentary Film History. (Cross-listed.)

Literature 118. Experimental Film and Video. (Cross-listed.)

Literature 120. Special Topics in Television Genres. (Cross-listed.)

Literature 140. History of Mass Culture in the United States. (Cross-listed)

Literature 197S. Special Topics in the United States Culture Industries. (Duke in Los Angeles)

## RELATED COURSES OFFERED REGULARLY

### Art History

169. Documentary Photography and Social Activism in the Nuclear Age. (Cross-listed.) *Stiles*



## **Cultural Anthropology**

- 104. Anthropology and Film. (Cross-listed.) *Litzinger*
- 110. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*
- 131S. Documentary Film/Video Theory and Practice. (Cross-listed.) *Staff*
- 134S. American Communities: A Documentary Video Approach. (Cross-listed.) *Staff*
- 210S. Ideology and the Image in Ethnographic Film. *Litzinger*

## **Dance**

- 146S. Dancing in the Movies. *Sommer*

## **Drama**

- 121S. Dramatic Writing. (Cross-listed.) *Clum or Wilson*
- 122S. Advanced Dramatic Writing. (Cross-listed.) *Wilson*
- 123S. Screenwriting. (Cross-listed.) *Wilson*
- 140S. Directing. *McAuliffe or Storer*
- 142S. Film and Video Theory and Practice. (Cross-listed.) *Burns*
- 173. Introduction to Film. (Cross-listed.) *Gaines, Radway, Surin, Tompkins, Torgovnick, or Willis*
- 174. Studies in Film History. (Cross-listed.) *Clum, Gaines, or Jameson*
- 178S. Special Topics in Film. (Cross-listed.) *Clum, Gaines, or Moses*

## **English**

- 28S. Studies in Film and Video. *Staff*
- 101A. Introduction to Film. (Cross-listed.) *Gaines, Radway, Surin, Tompkins, Torgovnick, or Willis*
- 101B. Introduction to Cultural Studies. (Cross-listed.) *Gaines, Radway, Surin, Tompkins, Torgovnick, or Willis*
- 101C, S. Documentary Film/Video Theory and Practice. (Cross-listed.) *Staff*
- 102S. Screenwriting. (Cross-listed.) *Wilson*
- 107S. Dramatic Writing. (Cross-listed.) *Clum or Wilson*
- 108S. Advanced Dramatic Writing. (Cross-listed.) *Wilson*
- 120. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*
- 122. Studies in Comparative World Cinema. (Cross-listed.) *Staff*
- 124. Sexualities in Film and Video. (Cross-listed.) *Clum, Gaines, or Moon*
- 156. History of Mass Culture in the United States. (Cross-listed.) *Gaines, Radway, Tompkins, Torgovnick, or Willis*
- 183S. Film and Video Theory and Practice. (Cross-listed.) *Burns*
- 185. Studies in Film History. (Cross-listed.) *Clum, Gaines, or Jameson*
- 189S. Special Topics in Film. (Cross-listed.) *Clum, Gaines, or Moses*
- 190. Television, Technology, and Culture. (Cross-listed.) *Gaines*
- 284. Contemporary Film Theory. *Gaines*

## **French**

- 164. French Cinema. *Bell*

## **German**

- 113. Studies in Comparative World Cinema. (Cross-listed.) *Staff*
- 161. European Cinema in Conflict: The Metropolis, War, Globalization, and the Everyday. *Risholm*

## **History**

- 150A. Documentary Film History. (Cross-listed.) *Gaines, Paletz, or Wood*
- 150B, S. American Communities: A Documentary Video Approach. (Cross-listed.) *Staff*

## **Italian**

- 170S. Film and the Italian Novel. (Cross-listed.) *Finucci*

## Literature

- 100. Introduction to Cultural Studies. (Cross-listed.) *Gaines, Radway, Surin, Tompkins, Torgovnick, or Willis*
- 110. Introduction to Film. (Cross-listed.) *Gaines, Radway, Surin, Tompkins, Torgovnick, or Willis*
- 112. Special Topics in National Cinema. *Staff*
- 113. Studies in Comparative World Cinema. (Cross-listed.) *Staff*
- 114. Film Theory. (Cross-listed.) *Gaines*
- 115. Sexualities in Film and Video. (Cross-listed.) *Clum, Gaines, or Moon*
- 116. Studies in Film History. (Cross-listed.) *Clum, Gaines, or Jameson*
- 117. Documentary Film History. (Cross-listed.) *Gaines, Paletz, or Wood*
- 118. Experimental Film and Video. *Staff*
- 119. Television, Technology, and Culture. (Cross-listed.) *Gaines*
- 120. Special Topics in Television Genres. *Staff*
- 140. History of Mass Culture in the United States. (Cross-listed.) *Gaines, Radway, Tompkins, Torgovnick, or Willis*
- 141. International Popular Culture. (Cross-listed.) *C. Davidson, Gaines, Radway, or Willis*
- 163. The Canadian Image: Cultural Production in French and English Canada. (Cross-listed.) *A. Davidson*
- 197S. Special Topics in the United States Culture Industries. *Staff*

## Music

- 169. Hollywood Film Music. *Gilliam*

## Political Science

- 156S. American Communities: A Documentary Video Approach. (Cross-listed.) *Staff*
- 180. Media in Comparative Perspective (B). (Cross-listed.) *Staff*
- 198. Documentary Film History (B). (Cross-listed.) *Gaines, Paletz, or Wood*
- 203S. Issues in Politics and the Media in the United States (A). (Cross-listed.) *Paletz*
- 219S. Film and Politics. *Paletz*
- 227S. Issues in International Communications (B). *Paletz*

## Public Policy Studies

- 105S. American Communities: A Documentary Video Approach. (Cross-listed.) *Staff*
- 154S. Free Press and Public Policy. *Stevens*
- 163S. Telecommunications Policy and Regulation. *Prak*
- 176S. American Communities: A Photographic Approach. (Cross-listed.) *Harris or Sartor*
- 177S. Advanced Documentary Photography. (Cross-listed.) *Harris*
- 180S. Writing for the Media. *Dancy or Reid*
- 181S. Advanced News Reporting. *Bates and Yeoman*

## Religion

- 184. Religion and Film. *Hillerbrand*

## Russian

- 113. Studies in Comparative World Cinema. (Cross-listed.) *Staff*
- 130. Soviet Cinema. (Cross-listed.) *Gaines, Jameson, and Lahusen*
- 135. Contemporary Russian Media. (Cross-listed.) *Andrews*
- 135A. Contemporary Russian Media. (Cross-listed.) *Staff*

## Sociology

- 160. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*
- 170. Mass Media. (Cross-listed.) *Staff*
- 182. Media in Comparative Perspective. (Cross-listed.) *Staff*

## Visual Arts

- 116. Photography. *Noland*
- 118S. American Communities: A Photographic Approach. (Cross-listed.) *Harris or Sartor*

- 119S. Advanced Documentary Photography. (Cross-listed.) *Harris*  
165S. Film Animation Production. (Cross-listed.) *Burns*

## RELATED SPECIAL TOPICS COURSES

### Art History

172. Topics in Asian Art: East Asian Cinema. (Cross-listed.) *Abe or Ching*

### Canadian Studies

- 282S. Canada: Media and Identity. (Cross-listed.) *Staff*

### French

- 141S, 142S. French Literature: World War II and French Film. *Orr*

### German

- 123S. Undergraduate Seminars: German Film History to 1945. *Risholm*

### Literature

293. Special Topics in Literature and History: The Rise of Consumer Culture in the United States, 1880-1930. *Radway*

### Portuguese

- 200S. Seminar in Portuguese Literature: Literatura e Cinema Os Classicos Brasileiros. *Damasceno*

### Public Policy Studies

- 195S. Selected Public Policy Topics: Community Service and the Documentary Tradition. (Cross-listed.) *Coles or Kelley*

- 195S. Selected Public Policy Topics: Entertainment Industry: Policy and Practice. *Staff*

- 195S. Selected Public Policy Topics: Communications Frontier Technology: Media, Democracy. *Fulton*

### Spanish

169. Topics in Nineteenth- and Twentieth-Century Spanish Literature: Spanish Cinema. *Sieburth or Vilaròs*

## FOCUS Program Courses (FOC)

For more information see the section on FOCUS Programs in the chapter "Special Study Centers, Programs, and Opportunities."

- 75S. **Genetics and Society in the Twentieth Century.** (NS) The historical evolution of genetics and molecular biology in the twentieth century, examined within a social framework. Intended to enable students to place current issues such as the human genome project in historical perspective. From the eugenic and racial hygiene movements of America and Germany to the molecular biology revolution of the past half-century; the scientific principles underlying modern biotechnology. Open only to students in the FOCUS Program. One course. *Baker*

105. **Special Topics in FOCUS.** Designed to provide a forum for discussing and bridging the issues that arise in the individual seminars in the various FOCUS Programs. The subject matter and specific format of the course vary from program to program. Open only to participants in FOCUS. Pass/fail grading only. Half course. *Staff*

## French

For courses in French, see Romance Studies.

# Genetics (GEN)

Professor Boynton, *Coordinator of the Certificate Program*

**Faculty in University Program in Genetics:** Associate Professor Kiehart, *Director* (cell biology); Professor Nevins, *Co-Director* (microbiology and genetics); Professors Antonovics (botany), Bastia (microbiology), Boynton (botany), Cullen (genetics and microbiology), Endow (microbiology), Gillham (zoology), Greenleaf (biochemistry), Hsieh (biochemistry), Keene (microbiology), Kredich (medicine and biochemistry), Laurie (zoology), Linney (microbiology), Modrich (biochemistry), Nicklas (zoology), Raetz (biochemistry), Rausher (zoology), Roses (neurobiology), Shaw (chemistry), Steege (biochemistry), Uyenoyama (zoology), Ward (immunology), and Webster (biochemistry); Associate Professors Been (biochemistry), Burdett (microbiology), Garcia-Blanco (pharmacology and cancer biology), Greene (biochemistry), Kaufman (biochemistry), Kohorn (botany), Kreuzer (microbiology), Pickup (microbiology), Schachat (cell biology), Vance (genetics), and Vilgalys (botany); Assistant Professors Capel (cell biology), Cunningham (zoology), De Lozanne (cell biology), Dong (botany), Fehon (zoology), Heitman (genetics and pharmacology and cancer biology), Hershfield (biochemistry), Honma (botany), Kornbluth (pharmacology and cancer biology), Lew (pharmacology and cancer biology), Lin (cell biology), Marchuk (genetics), Markert (immunology), McHeyzer-Williams (microbiology), Peterson (genetics), Sullenger (genetics), Sun (botany), Swenson (pharmacology and cancer biology), Titus (cell biology), Wharton (genetics and microbiology), and York (pharmacology and cancer biology); Associate Research Professor Pericak-Vance (genetics), Assistant Research Professor Speer (medicine); Adjunct Professors Drake (National Institute of Environmental Health Sciences), Kunkel (National Institute of Environmental Health Sciences), and Resnick (National Institute of Environmental Health Science)

A certificate for non-biology majors, or a concentration in the biology major\*, is available in this program.

The Certificate Program in Genetics is sponsored by and uses the extensive resources of the interdepartmental University Program in Genetics, established in 1968 to provide integrated graduate study in all facets of genetics at Duke University. The certificate program provides undergraduates with opportunities to learn about genetics and thereby to gain expertise in modern genetics with a view to its application in biology, medicine, public policy, law, or engineering.

## CERTIFICATE IN GENETICS

Non-biology majors may obtain a certificate in genetics by applying to the coordinator of the program and fulfilling the curricular requirements. To obtain a genetics certificate students must complete Chemistry 11L and 12L, Biology 25L, Biology 118 and Biology 119, Biology 184L or 185L, Genetics 191 and 192 (capstone independent research in genetics).

## GENETICS PROGRAM COURSES

**191, 192. Independent Study.** Directed reading and research under the supervision of faculty members from the University Program in Genetics, subject to the consent of the instructor and of the coordinator of the Certificate Program in Genetics. One course each. *Staff (Genetics Program)*

## OTHER COURSES IN GENETICS

Biology 118, 119. Principles of Genetics and Cell Biology I, II. One course. *Staff*  
Biology 184L. Experimental Cell and Molecular Biology. One course. *Arnaleo, Boynton, Dong, Kohorn, Laurie, Siedow, or Sun*

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\*See the bulletin entry for biology for information on the genetics concentration in that major.



Biology 185L. Experiments in Developmental and Molecular Genetics *Fehon, Lincoln, or McClay*  
 Biology 191 and 192. Independent Study. Prerequisite: consent of instructor, coordinator of the Certificate Program, and the appropriate director of undergraduate studies prior to registration.  
 Biology 281. DNA, Chromosomes, and Evolution. *Laurie and Nicklas*  
 Biology 283. Molecular Genetics of Organelles. One course. *Boynton and Gillham*  
 Biology 285S. Ecological Genetics. One course. *Antonovics*  
 Biology 286. Evolutionary Mechanisms. One course. *Antonovics, Rausher, and Uyenoyma*  
 Biology 288. Mathematical Population Genetics. Calculus required; statistics and linear algebra recommended. One course. *Uyenoyma*

Undergraduates who have taken the necessary prerequisite courses may enroll in upper division (graduate level) courses offered by the faculty in the University Program in Genetics.

Further details may be obtained from Dr. John E. Boynton, B330G LSRC Building or from the Genetics Program Office, 406 Nanaline H. Duke Building.

## Geology

For courses in geology, see Earth and Ocean Sciences.

## Germanic Languages and Literature

Professor Rolleston, Chair; Assistant Professor of the Practice Walther, *Director of Undergraduate Studies and Director of Language Program*; Professor Borchardt; Associate Professors Morton and Rasmussen; Assistant Professor Risholm; Professors Emeriti Alt and Phelps; Assistant Professor Emerita Bessent; Adjunct Assistant Professor Keul; Lecturers Dowell and Johns

A major or minor is available in this department.

### GERMAN (GER)

#### Language

**1-2. First-Year German: Introduction to German Language and Culture. (FL)** Four-skill (understanding, speaking, reading, writing) communicative approach to the language of everyday life in German-speaking countries, the language of their histories and societies, their arts and letters. Resources include audio, video, and computer-based materials. Two courses. *Walther and staff*

**14. Intensive German. (FL)** Accelerated introduction to German, combining in one semester the work of German 1-2. Classroom theory and practice with extended exposure to language laboratory and computer programmed instruction. Consent of director of undergraduate studies required. Two courses. *Staff*

**15. German for Reading Knowledge. (FL)** Foundations of German grammar and syntax; emphasis on vocabulary and translations. Not open for credit to students who have completed German 1-2, 14, or the equivalent. Students continuing German after German 15 should take the placement test. One course. *Staff*

*German 66 and 69 are usually followed by 100S, 117S, 121S, or 122S*

**65-66. Intermediate German. (FL)** Comprehensive review of German grammar, vocabulary building, reading, and writing skills through topic-oriented syllabus. Literary and nonliterary texts from a variety of media (books, newspapers, audio, video, film, internet) provide basis for discussion and cultural knowledge. Increased focus on reading, speaking, essay writing. Prerequisite: German 1-2, 14 or equivalent; for German 66 alone, appropriate placement test score or consent of instructor. Two courses. *Walther and staff*

**69. Accelerated Intermediate German. (FL)** Emphasis on utilizing grammatical structures in meaningful contexts, further development of reading, listening, speaking, and writing skills. Literary and nonliterary texts from a variety of media provide material for additional insight into German culture. Students desiring in-depth grammar explanations should consider taking German 65-66 (Intermediate German) instead. One course. *Walther and staff*

**98, 99. Introduction to German.** One or two course credits for Advanced Placement in German. One course each.

**100S. Business German. (FL)** Introduction to the language of commerce and industry; modes of expression for technology and marketing. Consent of instructor required. C-L: Comparative Area Studies. One course. *Dowell*

**117S, 118S. German Conversation and Composition. (FL)** Development of advanced proficiency in spoken and written German. Discussions, oral reports, and writing assignments based on authentic texts from a variety of media on issues of social and cultural significance in contemporary Germany. Required for German majors; other students by consent of instructor. One course each. *Dowell, Johns, or Walther*

**204S. Advanced Business German. (FL)** Topics include contract negotiations, management goals and strategies, banking and financial instruments, environmental issues. Prerequisite: German 100S or consent of instructor. One course. *Dowell*

### Literature and Culture

**121S, 122S. Introduction to German Literature. (AL, FL)** Principal authors, genres, concepts, and works of German literature. 121S: Middle Ages to the Baroque. 122S: Enlightenment to the present. One course each. *Staff*

**123S, 124S. Undergraduate Seminars. (AL, FL)** Topics vary. One course each. *Staff*

**126S. Rilke, Kafka, Mann. (AL, FL)** The shaping of twentieth-century thought by those literary figures whose writing has become world literature. One course. *Borchardt, Morton, or Rolleston*

**130S. From Enlightenment to Classicism. (AL, FL)** The major literary and cultural movements of the eighteenth century: Enlightenment, sentimentalism, *Sturm und Drang*, Weimar classicism. Representative works of Lessing, Klopstock, Herder, Goethe, Schiller, and Lenz. One course. *Morton*

**131S. The Novelle. (AL, FL)** The unique German prose genre from Tieck, Kleist, Grillparzer, Keller, Droste-Hülshoff to Hauptmann, Kafka, and Grass. History and theories from romanticism to naturalism. One course. *Morton*

**132S. The Märchen. (AL, FL)** Fairy tales as literary genre; historic relevance, function, types of Märchen from Volksmärchen (brothers Grimm) to Kunstmärchen (Goethe, Brecht, Bichsel) to the anti-Märchen (Karsunke, Gilbert). One course. *Borchardt*

**133S. Introduction to German Drama. (AL, FL)** The German theater from Lessing to Brecht, focusing on dramatic form and historical context. Topics may include: the Trauerspiel, *Sturm und Drang*, expressionism, epic theater, documentary drama. C-L: Drama 185S. One course. *Risholm or Walther*

**137S. Introduction to Twentieth-Century German Women Writers. (AL, FL)** This century's preeminent German women writers placed in historical and cultural context. Elementary concepts of literary analysis; emphasis on speaking and writing German. Readings in Bachmann, Seghers, Wolf. Other authors may include: Aichinger, Fleisser, Frischmuth, Kaschnitz, Leutenegger, Morgner, H. Müller, Rinser, Struck. C-L: Women's Studies. One course. *Rasmussen*

## Courses Taught Overseas

**67. Intensive Intermediate German. (FL)** Intensive grammar review and practice of spoken and written German combining in one semester the work of one year of intermediate German. Taught only in the Berlin Fall Semester Program. Prerequisite: German 1-2, 14, or equivalent. Two courses. *Staff*

**119S. Advanced German Language and Culture. (CZ, FL)** Advanced grammar review with emphasis on phonetics and conversation, literature, films, museums, and theater performances. Taught only in the Berlin program. Fulfills requirements for German 117S and 118S. Prerequisite: German 65-66, or German 67 or 69. Two courses. *Wohlfeil*

**150. Advanced Grammar, Composition, and Current Issues. (FL)** Advanced grammar review with emphasis on German expository style. Discussion of current events based on newspaper articles, videos, and television programs. Offered as a part of the summer program at the University of Erlangen. One course. *Koeppel*

**151S. Advanced Intensive German. (FL)** For advanced students to increase all four language skills: comprehension, speaking, reading, and writing. Discussion of current events based on newspaper articles, radio and television reports. Preparation for the German language examination required of all foreign students enrolling at German universities. Equivalent of German 117S or 118S but offered only in the Berlin semester program. One course. *Staff*

**152S. Berlin in Literature and Culture. (AL, FL)** Literary works of modern German writers; focus on the city of Berlin and its unique cultural and political heritage due to Germany's division from 1945-1989. Emphasis on art and architecture of Berlin reflecting both historical trends and political ideologies such as National Socialism and Marxism. Taught only in the Berlin semester program. C-L: Comparative Area Studies. One course. *Wohlfeil*

**153. Aspects of Contemporary German Culture. (CZ, FL)** Site visits, lecture, and discussion. Offered as part of the summer program at the University of Erlangen. C-L: Comparative Area Studies. One course. *Staff*

**155. Advanced German Cultural Studies. (CZ, FL)** Topics vary. Taught in German and only in the Berlin Semester Program. Prerequisite: P.N.d.S. (successful completion of German Language exam administered by the Free University). One course. *Staff*

## Courses Taught in English

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**113. Studies in Comparative World Cinema. (AL)** See C-L: Literature 113; also C-L: English 122, Film and Video, and Russian 113. One course. *Staff*

**123A, S. Special Topics.** Taught in English by visiting faculty. One course. *Staff*

**161. European Cinema in Conflict: The Metropolis, War, Globalization, and the Everyday. (AL)** History of European cinema via themes of the city, of war and memory, and of Europe's relations with the rest of the world. Films by Eisenstein, Lang, Godard, Herzog, and others. Open only to students in the FOCUS Program, Twentieth-Century Europe. C-L: Film and Video. One course. *Risholm*

**164S. Medieval German Literature. (AL)** Outstanding medieval texts in relation to contemporary literary theory: *Tristan and Isolde*, *The Nibelungenlied*, *Wolfdietrich*, poetry by Walther von der Vogelweide, ballads, religious texts. Taught in English. C-L: Medieval and Renaissance Studies. One course. *Rasmussen*

**165S. The Vikings and their Literature.** (AL) Old Norse culture and literature. Texts include the older and younger *Edda*, *Njal's Saga*, *Volsungasaga*, *Vinlandssaga*. Taught in English. C-L: Medieval and Renaissance Studies. One course. *Keul*

**180. Faust and the Faust Tradition.** (AL) Goethe's great work in the context of its intellectual and cultural inheritance and legacy. Taught in English. One course. *Borchardt or Morton*

### Independent Study and Honors Seminar

**191, 192. Independent Study.** Directed reading and research. Open only to qualified students in the junior year, by consent of the director of undergraduate studies. One course each. *Borchardt, Morton, Rasmussen, Risholm, Rolleston, or Walther*

**193, 194. Independent Study.** Directed reading and research. Open only to qualified students in the senior year, by consent of the director of undergraduate studies. One course each. *Borchardt, Morton, Rasmussen, Risholm, Rolleston, or Walther*

**197S, 198S. Honors Program Sequence.** (AL, FL) 197S: Senior Colloquium; team taught. 198S: Preparation and writing of research paper. See section on *Honors* under description of the major. One course each. *Staff*

### For Graduates and Advanced Undergraduates

**201. Introduction to Medieval German: The Language of the German Middle Ages and Its Literature.** (AL, FL) Fundamentals of medieval German language acquired through readings in the original Middle High German of Arthurian romance, heroic epic, and courtly poetry. C-L: Medieval and Renaissance Studies. One course. *Rasmussen*

**203S. Sex, Gender, and Love in Medieval German Literature.** (AL, FL) Historical contexts for emergence of courtly love and the role of desire and interpretation in Gottfried von Strassburg's *Tristan und Isolde*, courtly love lyric, "maere." C-L: Medieval and Renaissance Studies. One course. *Rasmussen*

**215S. German Baroque Literature.** (AL, FL) German literature of the grand gesture, of performance, of public posture; poetry of rhetoric; prose of the scoundrel, adventurer, and ne'er-do-well. C-L: Medieval and Renaissance Studies. One course. *Borchardt*

**225S. Introduction to Goethe.** (AL, FL) Major works of lyric, narrative, drama, and theory, throughout Goethe's career. One course. *Morton*

**226S. Goethe's Faust.** (AL, FL) Goethe's masterpiece and life's work, conceived as a summation of Western literature and mythology for the modern age. One course. *Borchardt or Morton*

**229S. Schiller: Aesthetic Theory and Practice.** (AL, FL) The nature and function of the artist and the work of art, in Schiller's essays, poetry, and dramas. One course. *Borchardt, Morton, or Rolleston*

**230S. German Romanticism.** (AL, FL) The emergence in the 1790s of a new cultural language: categories of self, history, interpretation, irony, and revolution. Theory, fiction, and poetry by Novalis, the brothers Schlegel, Tieck, Brentano, Eichendorff, Hoffmann, and Heine. One course. *Rolleston*

**233S. German Theater as Anti-Drama.** (AL, FL) The story of modern and postmodern drama with emphasis on Lenz, Büchner, Grabbe, Schnitzler, Brecht, Frisch, Dürrenmatt, Handke, expressionist drama, and Piscator's political theater. C-L: Drama 220S. One course. *Walther*

**245S. The Twentieth Century.** (AL, FL) The major movements and writers from the expressionists, Thomas Mann, Kafka, Rilke, and Brecht, to Böll, Grass, Handke, and Christa



Wolf. Emphasis on relations between text and history: World War I, Weimar, Third Reich, and the struggle to integrate past and present in post-Holocaust literature. C-L: Comparative Area Studies. One course. *Rolleston*

**247S. Postwar German Literature.** (AL, FL) The development of German literature after 1945. Topics vary: German literature between 1945 and the founding of the two states; the GDR novel and the question of realism; GDR drama after Brecht; West German literature. C-L: Comparative Area Studies. One course. *Staff*

**254S. Literature by Women.** (AL, FL) Topics may include: the beginnings of women's writing; gender, history, and literary representation in the work of twentieth-century women writers; women writers from World War II to the present. Bachmann, Fleisser, Keun, Kolmar, Langgässer, Lasker-Schüler, Leutenegger, Rinser, Sachs, Seghers, and Wolf. Not open to students who have taken German 137S. C-L: Women's Studies. One course. *Rasmussen*

## Linguistics

**260. History of the German Language.** (FL) Phonology, morphology, and syntax of German from the beginnings to the present. C-L: Linguistics and Medieval and Renaissance Studies. One course. *Rasmussen*

**261. Second Language Acquisition Theory and Practice.** (FL) Overview of current research in the fields of second language acquisition and foreign language pedagogy, theories of language acquisition and learning, implications for the teaching of the German language, literature, and culture at all levels. Readings and discussions on theoretical and professional issues, training in contemporary teaching techniques, approaches, and methods. C-L: Linguistics. One course. *Walther*

## Courses Taught in English

**248S. German Film from Weimar to Fascism.** (AL, CZ) German film from its inception through the Nazi period. Emphasis on the social, political, and cultural background of the period as well as specifics of film form and analysis. Focus on areas such as expressionist cinema, the realist film, Nazi propaganda and entertainment films. Taught in English. One course. *Risholm*

**249S. New German Cinema.** (AL, CZ) Postwar German film beginning with the popular "homeland" film and moving on to New German Cinema, emphasizing the social, political, and cultural background of the period. Diverse topics such as feminist filmmaking, auteur artists, contemporary cinema, and the Nazi past. The writings of filmmakers as well as theoretical issues in film criticism. Taught in English. One course. *Risholm*

**270. Consciousness and Modern Society.** (CZ) The blend of philosophy, literature, and sociology in German thinking about actual and possible societies. The idea of consciousness as producing involvement, detachment, or transformation. Marx, Nietzsche, Lukacs, Freud, Marcuse, Benjamin, Adorno, and Habermas. Taught in English. C-L: Comparative Area Studies and Perspectives on Marxism and Society. One course. *Rolleston*

**271S. Contemporary Theory and the German Tradition.** (AL) The reorientation of Western thought toward theories of knowledge and of language, from the eighteenth century to the present, and the significance of that paradigm shift for contemporary theory of literature and literary criticism. Readings in Kant, Herder, Mauthner, Wittgenstein, Heidegger, Habermas, and Apel. Taught in English. One course. *Morton*

**299S. Seminar in German Studies.** (CZ) Review of current debates and historical perspectives in the German cultural field, structured through contributing disciplines: social

and economic history, political theory and history, literature, fine arts, music, philosophy, and religion. Team-taught, involving a wide range of faculty in the German Studies Program. Taught in English. One course. *Morton or Rolleston and staff*

### Courses Currently Unscheduled

- 125S. Literature of Tolerance. (AL, FL)
- 135. German Literature and the Media. (AL, FL)
- 136S. Contemporary Germany. (AL, FL)
- 154. Deutsche Kulturgeschichte. (CZ, FL)
- 160. German Life and Thought. (CZ)
- 170S. The German Enlightenment and the Invention of Modernity. (AL)
- 174S. In Search of the Self: The German *Bildungsroman*. (AL)
- 185S. The Golden Twenties. (AL)
- 200S. Proseminar: Introduction to Literary Criticism. (AL, FL)
- 202S. Medieval Seminar. (AL, FL)
- 210S. Renaissance and Reformation. (AL, FL)
- 220S. Reason and Imagination: The German Eighteenth Century. (AL, FL)
- 227S. Goethe Seminar. (AL, FL)
- 231S. Romantic Outsiders. (AL, FL)
- 232S. The Lyric: Goethe to the Present. (AL, FL)
- 235S. Nineteenth-Century German Literature. (AL, FL)
- 236S. Empires of the Mind: Nineteenth-Century German Ideas. (AL, FL)
- 240S. Naturalism and Beyond: The Turn of the Century. (AL, FL)
- 241S. Nietzsche. (AL, FL)
- 242S. Expressionism. (AL, FL)
- 244A, S. International Expressionism. (AL)
- 244B, S. International Modernism. (AL)
- 246. German Letters in the Third Reich and in Exile. (AL, FL)
- 250S. German Literature and Classical Antiquity. (AL, FL)
- 251S. Germanic Mythology and Its Critics. (AL, FL)
- 252S. The Mystical Tradition. (AL, FL)
- 253S. The Image of America in German Literature. (AL, FL)
- 255S. Paradigmatic Issues in Literary Theory. (AL, FL)
- 262. Applied Linguistics. (FL)
- 272S. The German Literature of Fantasy. (AL)
- 273S. Franz Kafka and Thomas Mann. (AL)
- 274S. The Image of America in German Literature. (AL)
- 275S. German Women Writers. (AL)

### YIDDISH (YDH)

1, 2. Elementary Yiddish. (FL) A thorough study of elementary Yiddish grammar with reading, composition, and oral practice. No previous knowledge of German or Hebrew required. C-L: Judaic Studies. One course each. *Staff*

### Courses Currently Unscheduled

- 171. Yiddish Fiction in Translation. (AL)
- 191, 192. Independent Study.

### THE MAJOR

Students majoring in German develop language skills in their cultural and literary context. The international and humanistic emphasis makes the German major an appropriate companion to technical and career-oriented concentrations. Numerous opportunities are

available, including programs of study abroad, interdisciplinary programs, and Fulbright and German Academic Exchange Service (DAAD) scholarships.

The German major offers two tracks: (1) German and (2) German Studies

### **German**

*Requirements.* Ten courses, which may include two courses below the 100 level. Eight of the ten courses must be at the 100 level or above, including at least two at the 200 level. These must normally include the advanced conversation and composition courses, German 117S and 118S (or the equivalent taught in Berlin; German 119S, two courses) and either German 121S or 122S. Of departmental courses taught in English, only one may count toward the major.

### **German Studies**

*Requirements.* Ten courses at the 100 level or above. Courses taken in the department must normally include German 117S and 118S (or the equivalents taught in Berlin; German 119S, two courses), and at least two courses at the 200 level. Two of the ten courses may be taken in other departments with the approval of the director of undergraduate studies in German, provided such courses evince a clear focus on German culture, society, and history.

### **Graduation with Distinction**

Qualified students (see the section on honors in this bulletin) may apply or be invited to apply for graduation with distinction. The application deadline is preregistration for the fall semester of the senior year. Further information may be obtained from the director of undergraduate studies or the departmental honors representative.

## **THE MINOR**

### **German**

*Requirements.* Five courses at the 100 level or above, only one of which may be taught in English.

### **German Studies**

*Requirements.* Five courses at the 100 level or above, at least three of which must be taught in German. Two of the five courses may be taken in other departments with the approval of the director of undergraduate studies in German, provided such courses evince a clear focus on German culture, society, and history.

## **Greek**

For courses in Greek, see Classical Studies.

## **Health, Physical Education, and Recreation (PE)**

Professor Buehler, *Chair*; Associate Professor LeBar, *Director of Undergraduate Studies*; Associate Professors Harvey, Raynor, and Skinner; Assistant Professor of the Practice J. Ogilvie; Part-Time Instructors Alberici, Alleva, Beguinet, Bowen, Bowers, Burk, Coffman, Daffron, Doughty, Falcone, Forbes, Gilburg, Jindra, McMullan, N. Ogilvie, Orr, Rollins, Spector, Weatherington, Welsh, and Yakola

Courses in this program do not count toward distributional requirements.

### **ACTIVITY COURSES**

Each activity course listed below carries a half-course credit and is given on a pass/fail basis. The maximum amount of credit that counts for the undergraduate degree is one full

course, but additional courses may be taken without credit toward graduation. Students may repeat activity courses but will not receive credit for the repeated courses, with the exception of Physical Education 15, Weight Training.

**10. Bowling.** History of bowling; complete fundamentals and techniques; types of games; basic rules and scoring. Half course. *Bowen*

**11. Cardiorespiratory Conditioning.** Individualized programs in walking, jogging, running, cycling, and swimming. Half course. *Buehler*

**12. Aerobic Dance.** Dancing for cardiovascular and physical conditioning. Half course. *Jindra*

**14. Stress Management and Performance Enhancement.** Visualization, imagery, and relaxation techniques. Mind-body medicine approaches to life-style change. Sports psychology theories. Half course. *Burk*

**15. Weight Training.** Progressive, cumulative, and measurable physical conditioning. Half course. *Harvey*

**16. Endurance Swimming.** Individualized programs to improve skills and fitness. Half course. *Forbes or J. Ogilvie*

**17. Mountain Biking.** Individualized programs in mountain biking including bike maintenance, safety tips, single- and multi-track riding. Half course. *Yakola*

**20. Beginning Swimming.** Propulsion techniques, water safety, introduction to the five basic strokes. Half course. *Forbes*

**21. Intermediate Swimming.** Development of the five basic strokes, overarm side trudgen, and trudgen crawl. Half course. *Forbes*

**22. Lifeguard Training.** American Red Cross course which prepares an individual to qualify as a *non-surf* lifeguard. Preventative lifeguarding, emergencies, health and sanitation, water rescue and special situations, search and recovery operations, weather and environmental conditions. Corequisites: must have CPR and Red Cross Standard First Aid certification by the end of the course in order to receive Lifeguard Training certification. Half course. *Forbes*

**23. Water Aerobics.** Aerobic and anaerobic exercise performed in water, designed to promote physical conditioning. Half course. *J. Ogilvie*

**25. Water Safety Instructors Course.** American Red Cross Water Safety Instructors certification. Prerequisite: Physical Education 24. Half course. *J. Ogilvie*

**27. Kayaking.** Basic skills for kayaking in whitewater. Half course. *Harvey*

**28. Canoeing.** Basic skills for canoeing in whitewater. Half course. *Staff*

**30. Beginning Golf.** Half course. *Coffman*

**31. Intermediate Golf.** Stroke development and use of all clubs. Half course. *Coffman*

**32. Advanced Golf.** Use of all clubs; course strategy. Emphasis on playing. Half course. *Coffman*

**35. Beginning Racquetball.** Half course. *Staff*

**40. Beginning Tennis.** Half course. *LeBar*

**41. Intermediate Tennis.** Strategy of the game and stroke development. Half course. *LeBar*

**42. Advanced Tennis.** Stroke development with emphasis on strategy. Half course. *LeBar*



50. **Mixed Competitive Tennis.** Half course. *LeBar*
52. **Fencing.** Foils, épée, and saber. Half course. *Beguinet*
53. **Intermediate Fencing.** Further study of basics and theory. Half course. *Beguinet*
55. **Self-Defense: Karate.** Fundamentals of selected martial arts. Half course. *Bowen*
56. **Intermediate Karate.** Continued practice of basic technique. Introduction to round kick, back kick, free sparring, four Pinan Katas of the Wadoryu System. Half course. *Bowen*
59. **Aikido.** A method of unarmed self-defense that encourages discipline and a nonviolent attitude. Half course. *Bowen*
60. **Volleyball.** Half course. *Weatherington*
62. **Intermediate Aikido.** A method of unarmed self-defense combining movements taken from sword and spear fighting, jujitsu, and aikijitsu. Half course. *Bowen*
63. **Cardio-Kickboxing.** A noncontact activity designed to teach self-defense techniques while building the muscular and cardiovascular systems. Half course. *Bowen*
65. **Yoga.** Traditional hatha yoga combined with balanced structural alignment to develop strength, flexibility, and mental concentration. Half course. *Orr or Spector*
66. **Intermediate Hatha Yoga.** Continuation of hatha yoga postures and awareness of breathing to develop more flexibility and calmness. Yoga philosophy. Prerequisite: previous experience with yoga. Half course. *Spector*
71. **Country/Western Dancing.** Texas two-step, East Coast swing, cha-cha, waltz, and country line dancing. Half course. *Daffron*
72. **Social Dancing.** Waltz, foxtrot, tango, cha-cha, rumba, jitterbug, rock, disco, and others. Half course. *Daffron*
73. **Intermediate Social Dance.** Review of cha-cha, rumba, Viennese waltz, and introduction to Latin dances mambo, samba, and merengue. Continued development of smooth and rhythm technique. Prerequisite: Physical Education 72. Half course. *Daffron*
74. **Advanced Social Dance.** Continued instruction in dances from Physical Education 73. Introduction to West Coast swing. Development of both competitive style dances and social dance technique. Partners recommended. Prerequisite: Physical Education 73 or equivalent. Half course. *Daffron*
79. **Beginning Equitation.** Introduction to horseback riding: basic horsemanship; walk, trot, and canter. Half course. *Rollins*
80. **Intermediate Equitation.** Skills in hunt seat riding. Emphasis on balance seat and focus on improving skills in walk, trot, canter, and jumping. Half course. *Rollins*
81. **Advanced Equitation: Hunt Seat.** Cross-country and stadium jumping techniques. Half course. *Rollins*
90. **Advanced First Aid and Cardiopulmonary Resuscitation.** Certification in advanced first aid and CPR. Half course. *Raynor*
- 91-92. **Emergency Medical Technician Course.** Instruction in emergency medical training which will prepare the student to qualify for certification as an emergency medical technician. Two-semester course; half course per semester. Prerequisite: CPR certification. One course. *Bowers*

**94. Care and Prevention of Athletic Injuries.** Basic instruction in prevention, recognition, care, and rehabilitation of athletic-related injuries. Half course. *Staff*

**96. Basketball.** Development of individual and team skills. Half course. *Alberici or Welsh*

## **THEORY COURSES**

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Buehler*

**120. Theory and Practice of Coaching.** Fundamentals, strategies, and psychology of coaching. Emphasis on basketball, and track and field. Additional topics such as safety and liability, gender equity, the media, regulations, and ethics. One course. *Yakola*

**150. Health, Fitness and Wellness.** Relationships among health, wellness, exercise, nutrition and fitness. Scientific evidence pertaining to diet and nutrition, weight control, cardiovascular and strength fitness, stress management, tension control, and drugs and alcohol. Development of a personal lifetime fitness program. One course. *LeBar*

**170. History and Issues of Sports.** Sports from ancient to modern times with an emphasis on sports in America. Not open to students who have taken this course as Health, Physical Education, and Recreation 49S. One course. *Buehler*

**172. Administration in Sports Management.** Philosophy, financial structure, administrative structure, fund-raising, NCAA legislation, personnel decision, and scheduling events. One course. *Alleva or Buehler*

**174. Sports Marketing of Collegiate Athletic Events.** Philosophy, marketing strategies, planning, and problem solving in promoting collegiate athletic events. One course. *Yakola*

## **COURSES CURRENTLY UNSCHEDULED**

**13. Weight Control.**

**24. Basic Rescue and Emergency Water Safety.**

**26. Scuba Diving.**

**29. Water Polo.**

**36. Intermediate Racquetball.**

**37. Advanced Racquetball.**

**48. Men's Competitive Tennis.**

**70. Folk Dancing.**

**93. Orienteering.**

**95. Wilderness Skills.**

**98. Frisbee.**

**110. Diet and Nutrition.**

**112. Sexuality, Stress, and Substance Abuse: Choices, Risks, and Consequences.**

## **Health Policy**

Assistant Research Professor Conover, *Director*

A certificate, but not a major, is available in this program.

The program speaks to the needs of students preparing for careers in health care policy, management, and the associated professions as the American health care industry enters into a period of rapid and profound change.

Courses in the health policy certificate program address three interrelated goals: (1) to investigate the machinery of contemporary health policy-making and to understand the broad political dynamics which have conditioned American health policy, past and present; (2) to familiarize students with the institutional and economic complexity of the American health care system through the study of the interaction between the key players in health care

financing and organization, employers, private insurance carriers, government regulators, health care providers, and consumers; and, (3) to explore the cultural and ideological underpinnings of modern conceptions of health and the recurrent ethical dilemmas facing health care providers, patients, and policymakers.

The program draws upon established research programs relating to health services centered in economics, political science, public policy, and sociology but recognizes the inspired contributions to health care debates originating in the disciplines of anthropology, history, law, medical arts, philosophy, psychology, and religion.

## PROGRAM REQUIREMENTS

The health policy certificate program is open to all undergraduates. Successful candidates must complete the prescribed combination of six courses: any one methodology course; two courses drawn from the core set of health policy course offerings; any two additional elective courses; and the capstone course. For students matriculating at Duke in fall 1998 and thereafter, no more than three of the six courses taken to satisfy the requirements of the certificate may originate in a single department or program. Appropriate courses may come from the list given below or may include other courses (new courses, special topics courses, independent study, and, under special circumstances, courses offered through the UNC School of Public Health\*) as approved by the director.

For further details, contact the director at the Center for Health Policy, Law and Management, Room 125 Old Chemistry Building, or consult the program website at <http://www.hpolicy.duke.edu>

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\*Subject to regulations governing interinstitutional course registration. Note that the UNC School of Public Health semesters and daily schedules differ from those of Arts and Sciences at Duke.

### Methods Courses (any one course)

#### *Regularly Scheduled Courses*

##### **Economics**

2D. Competition, Monopoly, and Welfare. *Crawford*

52D. Competition, Monopoly, and Welfare. *Staff*

261. Evaluation of Public Expenditures. (Cross-listed.) *Conrad*

##### **Public Policy Studies**

55D. Introduction to Policy Analysis. *Hamilton, Lipscomb, or Mayer*

156. Health Economics. (Cross-listed.) *Sloan*

255S. Health Policy Analysis. *Conover or Taylor*

261. Evaluation of Public Expenditures. (Cross-listed.) *Conrad*

### Core Courses (any two courses)

#### *Regularly Scheduled Courses*

##### **Economics**

156. Health Economics. (Cross-listed.) *Sloan*

##### **Public Policy Studies**

157. Health Policy. *Barboriak and Henderson-James*

##### **Sociology**

171. Comparative Health Care Systems. (Cross-listed.) *Staff*

#### *Special Topics Courses, Offered Periodically*

##### **Public Policy Studies**

264S. Research Seminar. Topics in Public Policy

264S.07. Getting Value for Money in Health Care: Rationing in Theory and Practice. *Lipscomb*

264S.53. Health Policy: Prevention and Management. *Whetten-Goldstein*

264S.70. Social Policy Implementation. *Lin*

264S.72. Managed Care. *Lin*

## **Sociology**

227S. A-D. Proseminars in Medical Sociology. Selected topics in medical sociology. One course. *George, Gold, Jackson, Lin, or Thornton.*

A. Social Structure and Health

B. Social Behavior and Health

C. Organization and Financing of Health Care (May not be counted toward certificate if Sociology 227C is counted)

D. Special Topics in Medical Sociology (for example, social epidemiology, stress and coping, health and aging)

## **Elective Courses (any 2 courses)**

### *Regularly Scheduled Courses*

## **Cultural Anthropology**

185S. The Canadian Health Care System. *Warren*

## **Economics**

163. Economics of the Environment. Prerequisite: Economics 52. One course. *Smith*

## **Environment**

270. Resource and Environmental Economics. *Kramer*

272. Evaluation of Public Expenditures. *Staff*

## **History**

105S.05 History of Medical Ethics. *Staff*

189B. History of Public Health in America. *Staff*

279, 280. Health, Healing, and History. *English*

## **Law**

347. Health Care Law and Policy. Open to limited undergraduate enrollment with consent of instructor. *Havighurst*

(Note: The Law School semesters and daily schedules differ from those of Arts and Sciences; interested students should check with the Law School to find exact course times. )

## **Philosophy**

118. Philosophical Issues in Medical Ethics. Prerequisites: for freshman, previous philosophy course and consent of instructor. One course. *Brandon or Golding*

## **Political Science**

107. Environmental Politics and Policies in the Industrial World. *McKean*

147. Environmental Politics and Policies in the Developing World. *McKean or Miranda*

148D. Environmental Politics Beyond Borders. *McKean*

176A, B. Perspectives on Food and Hunger. *Johns*

## **Psychology**

109A. Health Psychology. Not open to students who have taken Psychology 98. One course. *Anderson or Keefe*

129. Psychology and the Law. Prerequisite: Psychology 99 or 108 or Psychology 116. *Fischer*

## **Public Policy Studies**

149. United States Environmental Policy. Consent of instructor required. *Besse or Miranda*

266. Comparative Social Policy. *Staff*

274. Resource and Environmental Policy. Prerequisite: Environment 270L Public Policy Studies 272, or consent of instructor. *Ascher*

## **Religion**

182. Medicine and Religion in American Society. Not open to students who have taken Religion 159. *Joyce*

## **Sociology**

112. American Demographics. *Land, Myers, or Parnell*

123. Social Aspects of Mental Illness. *George or Jackson*

162. Health and Illness in Society. *Lin*

163. Aging and Health. *George or Gold*

## **Capstone Course (required)**

Public Policy Studies 255S. Health Policy Analysis. A group project designed for candidates seeking the undergraduate certificate. Consent of instructor required. *CHPRE Faculty*



## Hebrew

For courses in Hebrew, see Asian and African Languages and Literature.

## Hindi

For courses in Hindi see Asian and African Languages and Literature.

## History (HST)

Professor Roland, *Chair*; Professor Hewitt, *Associate Chair*; Associate Professor French, *Director of Undergraduate Studies*; Professors Cell, Chafe, Dirlik, Gaspar, Gavins, Goodwyn, Herrup, Keyssar, Koonz, Kuniholm, Lerner, Mauskopf, M. Miller, Payne, Petroski, Reddy, Richards, Shatzmiller, TePaske, Thompson, Witt, and Wood; Associate Professors English, Ewald, Green, James, Nathans, Neuschel, Robisheaux, and Wigen; Assistant Professors Balleisen, Biddle, Hacohen, Humphreys, Mazumdar, Partner, Peyroux, and Thorne; Professors Emeriti Cahow, Colton, Davis, Durden, Ferguson, Franklin, Holley, Parker, Preston, Ropp, A. Scott, Watson, and Young; Assistant Professor of the Practice El Hamel; Adjunct Professor Roberts; Adjunct Associate Professors Pelech and Wilson; Adjunct Assistant Professors Litle and Y. Miller; Visiting Professor Coles; Visiting Assistant Professors Kaiwar and Wall

A major or a minor is available in this department.

History courses offer students from all disciplines within the university an opportunity to investigate the past, gain perspective on the present, and improve their critical faculties. History provides an integrating principle for the entire learning process, and students of history gain a sense of human development, an understanding of fundamental and lasting social processes, and a feeling for human interrelatedness. History courses train the mind by improving skills in communicating thought and imagination.

### INTRODUCTORY COURSES

Students may benefit from taking at least one introductory course before proceeding to advanced-level courses. Majors take two introductory courses in history (21, 22; 21D, 22D; 21S, 22S, 22X; 25, 26; 53, 54; 75, 76; 91, 92; 91D, 92D; 91S, 92S, 92X or 93S); History 94 and 98 may not be used to fulfill the introductory course requirement. Additional courses may be chosen from this group as electives or part of the departmental major.

**20S. Studies in Special Topics. (CZ)** Opportunities for freshmen to engage with a specific historical issue, with emphasis on student writing. Topics vary each semester offered. One course. *Staff*

**21. Europe to the Eighteenth Century. (CZ)** Development and world impact of European civilization, critical evaluation of historical interpretations, and investigation of history from primary sources. One course. *Staff*

**21D. Europe to the Eighteenth Century. (CZ)** A lecture-discussion version of History 21. One course. *Staff*

**21S. Europe to the Eighteenth Century. (CZ)** A seminar version of History 21. One course. *Staff*

**22. Europe from the Eighteenth Century. (CZ)** Development and world impact of European civilization, critical evaluation of historical interpretations, and investigation of history from primary sources. One course. *Staff*

**22D. Europe from the Eighteenth Century. (CZ)** A lecture-discussion version of History 22. One course. *Staff*

- 22S. Europe from the Eighteenth Century. (CZ)** A seminar version of History 22. One course. *Staff*
- 22X. Culture and Politics in Modern Europe. (CZ)** A survey of major themes in the political and cultural history of modern Europe. Intended for students who participated in the fall semester FOCUS program or who have Advanced Placement credit in European History. Specific topics may change from year to year. Readings in primary sources and historiography. One course. *Hacohen*
- 25. Introduction to World History: To 1700. (CZ)** The beginning and evolution of civilization; major traditions of Eurasia (Greek, Christian European, Indian, Chinese, Islamic); Africans and American Indians; the European invasion of America; foundations of the European world economy; Europe's preparation for world hegemony. C-L: Comparative Area Studies. One course. *Staff*
- 26. Introduction to World History: Since 1700. (CZ)** Establishment of European political, economic, and cultural hegemony; non-Western responses; the decline of Western hegemony. C-L: Comparative Area Studies. One course. *Staff*
- 29. Comparative Revolutions: France, 1789–Russia, 1917. (CZ)** An introductory investigation into the general significance of political revolutions in the modern Western world. Focuses on two classic case studies: the French and Russian revolutions. Compares origins, development, and consequences of these influential historical transformations. Secondary comparisons with the American Revolution. One course. *M. Miller*
- 32S. Modern World Environmental History. (CZ)** A broad comparative and global view of human interaction with nature, that is, environmental history since 1800 to the present. The intensification of human land use (expansion of arable and deforestation) throughout the world and new industrial forms dependent upon massive burning of fossil fuels, the human activities that contribute to global warming and global change most directly. Changes in human populations; disease patterns, species depletion; human relations with wildlife and human perceptions of nature for the period covered. Open only to students in the FOCUS Program. One course. *Richards*
- 49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*
- 52S. North Carolina Architecture and Social History. (AL, CZ)** The major architectural forms and/or sites in North Carolina, past and present. Introduction to basic architectural terminology, structures, and forms before learning about specific buildings and architects in the state. Social history of North Carolina, from colonial times to the present. Emphasis on the growth and evolution of communities, families, economies, cultures, perceptions, and power struggles. Field trips to area buildings, historical sites, state archives. Open only to students in the FOCUS Program. One course. *Nathans*
- 53. Greek History. (CZ)** See C-L: Classical Studies 053. One course. *Oates*
- 54. Roman History. (CZ)** See C-L: Classical Studies 054. One course. *Boatwright or Oates*
- 55. History, Ideas, and Material Life. (CZ)** The intellectual and religious life of the fourteenth century presented within the context of the economic, political, and social framework of this period of plague, demographic depression, and economic contraction. Open only to students in the FOCUS Program Medieval and Renaissance Studies. One course. *Witt*
- 56. Medieval Cities: Walls, Wealth, and Welfare. (CZ)** The historical foundations of several major medieval cities; focus on the regulatory mechanisms that medieval populations developed for organizing activities as diverse as building walls, lending money, and practicing medicine. Open only to students in the FOCUS Program Medieval and Renaissance Studies. C-L: Medieval and Renaissance Studies. One course. *Green*

**57. Poverty and Sanctity in Medieval Society. (CZ)** An examination of contemporary documents about heretics, saints, lepers, and moneylenders as well as the poverty that generated powerful movements for religious reform in the twelfth through the fourteenth centuries. Will consider both "heretical" and "orthodox" figures and beliefs as well as the conditions of profit making and poverty to gain a sense of the preoccupations that informed medieval Europeans' notions of a rightly ordered society. Open only to students in the FOCUS Program and Medieval and Renaissance Studies. C-L: Medieval and Renaissance Studies. One course. *Peyroux*

**75, 76. The Third World and the West. (CZ)** Economic, social, political, and cultural relationships, 1500 to the present. C-L: African and African-American Studies 70, 71, Comparative Area Studies, Latin American Studies, and Perspectives on Marxism and Society. One course each. *Staff*

**91. The Development of American Democracy to 1865. (CZ)** The trends vital to an understanding of the United States today. The development of American democracy. Problems of foreign policy, the growth of capitalism, political practices, social reform, and conflicting ideals are considered in relation to this main theme. One course. *Staff*

**91D. The Development of American Democracy to 1865. (CZ)** A lecture-discussion version of History 91. One course. *Staff*

**91S. The Development of American Democracy to 1865. (CZ)** Seminar version of History 91. One course. *Staff*

**92. America from 1877 to the Present. (CZ)** A general introduction to American history from the end of Reconstruction to the present. The impact of industrialization, immigration, urbanization, and the rise of mass culture in the United States; the effect of depressions and wars on American society and politics; and the roots and results of reform movements ranging from populism and progressivism to the civil rights, women's, and environmental movements. Ongoing debates about the government's proper economic and social role; changing views of ethnicity, race, and gender in America, and the determinants of United States foreign policy. One course. *Wall*

**92D. America from 1877 to the Present. (CZ)** A lecture-discussion version of History 92. One course. *Wall*

**92S. America from 1877 to the Present. (CZ)** Seminar version of History 92. One course. *Staff*

**92X. Issues in United States History. (CZ)** Major crises in America: from the Great Depression to the 1960s. Intended for students who participated in the fall semester FOCUS program or have Advanced Placement credit in United States History. One course. *Gaspar*

**93S. Modern American History. (CZ)** Emphasizes topics considered appropriate for the Twentieth-Century America Program (FOCUS). Open only to students in that program. One course. *Gaspar*

**94. The Age of Augustus. (CZ)** Does not count for introductory course requirements. See C-L: Classical Studies 070. One course. *Staff*

**98. Introduction to Canada. (SS)** Does not count for introductory course requirements. See C-L: Canadian Studies 98; also C-L: Comparative Area Studies, Economics 98, Political Science 98, and Sociology 98. One course. *Staff*

## **COURSES TAUGHT IN DUKE STUDY ABROAD PROGRAMS**

Courses numbered 100 with a letter suffix (100A, 100B . . . 100Z) are lecture courses taught in Duke-administered study-abroad programs, for example, in Germany, Italy,

France, China. These courses provide the same credit and fulfill the same curriculum requirements as any 100-level lecture course in the history department.

**100. A-R. Study Abroad: Special Topics on History.** Register for course by designated suffix indicating the specific country. One course. *Staff*

100A. Duke in Madrid: Special Topics on History. (CZ) One course. *Staff*

100B. Duke in Spain: Special Topics on History. (CZ) One course. *Staff*

100C. Duke in Britain: Special Topics on History. (CZ) One course. *Staff*

100E. Duke in China: Special Topics on History. (CZ) One course. *Staff*

100F. Duke in France: Special Topics on History. (CZ, FL) One course. *Staff*

100H. Duke in Andes: Special Topics on History. (CZ) One course. *Staff*

100I. Duke in Italy: Special Topics on History. (CZ) One course. *Staff*

100J. Duke in Russia: Special Topics on History. (CZ) One course. *Staff*

100K. Duke in Australia: Special Topics on History. (CZ) One course. *Staff*

100L. Duke in Germany: Special Topics on History. (CZ) One course. *Staff*

100M. Duke in Oxford: Special Topics on History. (CZ) One course. *Staff*

100N. Duke in Japan: Special Topics on History. (CZ) One course. *Staff*

100O. Duke in Vienna: Special Topics on History. (CZ) One course. *Staff*

100Q. Duke in India: Special Topics on History. (CZ) One course. *Staff*

100R. Duke in Venice: Special Topics on History. (CZ) One course. *Staff*

**100S. Study Abroad: Seminar on Historical Topics.** (CZ) Register for country by the section designated in the Official Schedule of Courses. One course. *Staff*

## UNDERGRADUATE COLLOQUIA

**101C. Terrorism, 1848-1968.** (CZ) A comparative analysis of the origins and development of modern terrorism in the West (Europe, Russia, and the United States). C-L: Comparative Area Studies. One course. *M. Miller*

**101E. Nationalism and Exile.** (CZ) The dilemmas confronting Russian and European exiles in the nineteenth and twentieth centuries in the context of nation-state identities. Focuses on political and literary exiles forced from their native countries. Central to the study is the role of the modern nation-state, from whose boundaries the exiles were expelled. One course. *M. Miller*

**101G, 102G. Introduction to Islamic Civilization.** (CZ) Not open to students who have taken Religion 162, 163. See C-L: Religion 146, 147; also C-L: Comparative Area Studies, Cultural Anthropology 147, 148, and Medieval and Renaissance Studies. One course each. *Cornell, Lawrence, and staff*

**101K. Topics in Chinese Civilization.** (CZ) C-L: Comparative Area Studies. One course. *Dirlik*

**101M. Asian-Pacific Region in Historical Perspective.** (CZ) The emergence of the Asian-Pacific region as a recognizable structure from the nineteenth century onward. Premodern history will be dealt with only to the extent that it is necessary for understanding later developments. The role played by the flow of commodities, people, ideas, and other cultural artifacts. C-L: Comparative Area Studies. One course. *Dirlik*

## COURSES ON SPECIAL TOPICS

### Lecture Courses

Courses numbered 103 or 104 with a letter suffix (103A, 104A; 103B, 104B . . . 103Z, 104Z) are lecture courses on special topics, concerning subject matter which the department does



not endeavor to cover on a routine basis. Some will be offered only once and therefore will not appear in the bulletin. If such a course is likely to be offered more than once, it will be listed in the bulletin.

**103, 104. Lectures in Special Topics. (CZ)** Individual courses in this series may be taught more than once or on a one-time basis only. One course each. *Staff*

#### **Seminar Courses**

**105S, 106S. Seminars in Selected Topics. (CZ)** One course each. *Staff*

#### **UNDERGRADUATE INTERMEDIATE-LEVEL COURSES**

**107A. Tudor/Stuart Britain. (CZ)** C-L: Comparative Area Studies and Medieval and Renaissance Studies. One course. *Herrup*

**107B. Modern Britain. (CZ)** C-L: Comparative Area Studies and Medieval and Renaissance Studies. One course. *Thorne*

**108C. Canadian-American Relations. (CZ)** The Canadian-United States relationship in its diplomatic, military, economic, and cultural aspects from the American Revolution to the present, with emphasis on the twentieth century. C-L: Canadian Studies and Comparative Area Studies. One course. *Thompson*

**108D. Across the Great Divides: The United States and Canadian Wests in the Nineteenth and Twentieth Centuries. (CZ)** An examination of the United States and Canadian westward movements, considering in comparative contexts: the dispossession of Native Peoples; federal government expansionist policies; the ranching, farming, and resource-extracting frontiers; immigration and ethnic diversity; women's experiences of the West; the transition of territories to states and provinces; political insurgencies. C-L: Canadian Studies. One course. *Thompson*

**108E, S. The Canadian Health Care System. (SS)** See C-L: Canadian Studies 185S; also C-L: Comparative Area Studies, Cultural Anthropology 185S, Economics 185S, Political Science 185S, Public Policy Studies 187S, and Sociology 185S. One course. *Warren*

**108F. Introduction to North America. (CZ, SS)** See C-L: North American Studies 110; also C-L: Cultural Anthropology 129, Economics 115, Latin American Studies, Political Science 119, Public Policy Studies 115, Romance Studies 125, and Sociology 109. One course. *Thompson*

**109. Contemporary Global Issues. (SS)** See C-L: Comparative Area Studies 109; also C-L: Cultural Anthropology 109, Political Science 160, and Sociology 175. One course. *Staff*

**110. History of Eastern Europe in Modern Times. (CZ)** The development of the nations and nationalities of Eastern Europe since the early eighteenth century. C-L: Comparative Area Studies. One course. *Lerner*

**111A. Early America to 1760. (CZ)** Pre-Columbian explorations, European invasion of North America, the evolution of race slavery, and the responses of the native American peoples. Not open to students who have taken the former History 111. One course. *Wood*

**111B. Era of the American Revolution, 1760-1815. (CZ)** Origins, evolution, and consequences. Attention to economic, social, and geographical questions, as well as military and political. Not open to students who have taken the former History 112. One course. *Wood*

**111C. The Emergence of Modern America: The United States from the 1890s to the Cold War. (SS)** American economic, social, and political history from the final decades of the

nineteenth century to the onset of the Cold War. Emphasis on the evolution of the political economy of the United States, for example, the development of the state, of durable economic and political institutions, the locus of power. Topics include: the late nineteenth-century transformation of the economy, the role of technology and science, industrial depressions, World War I and World War II, the New Deal and the emergence of a welfare state, and the rise of an American empire. C-L: Perspectives on Marxism and Society. One course. *Keyssar*

**112A, 112B. The World in the Twentieth Century. (CZ)** Imperialism and decolonization, war, revolution, international capitalism and depression, science and technology. 112A: 1900 to 1945; 112B: 1945 to the present. C-L: Comparative Area Studies. One course each. *Cell*

**113B. Europe's Colonial Encounter, 1492-1992. (CZ)** Surveys the impact of colonial expansion on European economic development, political culture, and popular identity from the "age of discovery" through the present. C-L: African and African-American Studies 113B. One course. *Thorne*

**114A, S. Islam in West Africa. (CZ)** See C-L: African and African-American Studies 114S. One course. *El Hamel*

**115A. History of Africa: From Antiquity to Early Modern Times. (CZ)** Beginning with civilizations known from archaeological records to the early modern era. Topics include African ecologies and ecological adaptations; Egyptian civilization; dynamics of agrarian and pastoral communities; state formation; long distance trade; Islam; contacts with Europeans. Methodologies and sources for reconstructing Africa's past. Not open to students who have taken the former History 115. C-L: African and African-American Studies 115A, Comparative Area Studies, and Women's Studies. One course. *El Hamel or Ewald*

**115B. History of Africa: From Early Modern Times to Independence. (CZ)** Beginning with the dynamics of African societies before the onset of European engagement in the continent and covering the impact of the Atlantic economy; expansion of long distance maritime and overland trade; Islam and Islamic reform; state formation; responses to colonialism; independence movements; the postcolonial state. African novels, autobiographies, and films, as well as scholarship by Africans. Not open to students who have taken the former History 115. C-L: African and African-American Studies 115B, Comparative Area Studies, and Women's Studies. One course. *El Hamel or Ewald*

**116. Aspects of Medieval Culture. (CZ)** See C-L: Medieval and Renaissance Studies 114; also C-L: Art History 139, and Classical Studies 139. One course. *Rasmussen, Solterer, or Witt*

**117. Early Modern Europe. (CZ)** The economic, social, and political history of early modern Europe. C-L: Comparative Area Studies, Medieval and Renaissance Studies, and Women's Studies. One course. *Neuschel*

**118A. American National Security Policy from 1945 to 1975. (CZ)** Evolution of American defense policy, nuclear and conventional, within the political context of the Cold War. Not open to students who have taken the former History 157, American National Security Policy from 1945 to 1975. One course. *Biddle*

**118B. Warfare in the Twentieth Century. (CZ)** Key conflicts of this century evaluated in terms of causes and consequences (political, social, and economic), and strategy and technology (war plans, weapons systems, and doctrine). One course. *Biddle*

**118C. History of the World Wars. (CZ)** An examination of the origins, course, and consequences of the world wars of this century. One course. *Biddle*

**119A, 119B. Native American History. (CZ)** A survey of conditions and events from precolonial times to the present. C-L: Canadian Studies and Comparative Area Studies. One course each. *Wood*

- 120. History of Socialism and Communism. (CZ)** The origins and development of socialist and communist movements from pre-Marxian times to the present. Not open to students who have taken History 239. C-L: Comparative Area Studies. One course. *Lerner*
- 121A. America in International Affairs, 1607-1861. (CZ)** The diplomacy of the colonial, revolutionary, and early national periods. C-L: Comparative Area Studies. One course. *Staff*
- 121B. The United States as a World Power: 1861-1941. (CZ)** American diplomacy from the beginning of the Civil War to entry into World War II. C-L: Canadian Studies. One course. *Staff*
- 123S. Madness and Society in Historical Perspective. (SS)** Mental illness and psychiatric treatment from antiquity to the present with special concentration on the nineteenth and twentieth centuries in Europe, America, and Russia. C-L: Comparative Area Studies. One course. *M. Miller*
- 124S. Slave Society in Colonial Anglo-America: The West Indies, South Carolina, and Virginia. (CZ)** The development of slave-based societies and the production of staple crops for export. C-L: African and African-American Studies 124S and Comparative Area Studies. One course. *Gaspar*
- 126S. Women in the Ancient World. (CZ)** See C-L: Classical Studies 104S; also C-L: Women's Studies. One course. *Boatwright*
- 127A. The Caribbean, 1492-1700. (CZ)** The Caribbean region from the arrival of Columbus (1492) to the emergence of sugar and slavery as powerful shapers of society and culture, by 1700. C-L: African and African-American Studies 127A and Latin American Studies. One course. *Gaspar*
- 127B. The Caribbean in the Eighteenth Century. (CZ)** The development of Caribbean society and economy in the contexts of slavery, empire, international rivalry, and democratic revolution. Not open to students who have taken History 127. C-L: African and African-American Studies 127B and Latin American Studies. One course. *Gaspar*
- 129A. Experiment in Republicanism: The United States, 1787-1860. (CZ)** Not open to students who have taken the former History 129. One course. *Nathans*
- 129B. From Victorian to Corporate America, 1820-1900. (CZ)** Not open to students who have taken History 130. One course. *Nathans*
- 130A. Modern Ireland. (CZ)** A comparison of Irish history with British imperial history. Survey of Irish history from the Elizabethan conquest to the present. One course. *Cell*
- 131B. The Spanish Caribbean. (CZ)** Cuba, the Dominican Republic, and Puerto Rico from the encounter in 1492 to the present with special emphasis on the early days of colonization, intercolonial rivalry, comparative economic and social developments, and the Cuban revolution. C-L: Comparative Area Studies and Latin American Studies. One course. *TePaske*
- 132. Modern World Environmental History, 1500 to the Present. (CZ)** Environmental effect of global economic growth. Impacts of agriculture, forestry, mining, and industry on the biosphere. Use of freshwater resources. Effects of modern transportation and urbanization. The world environmental movement. Not open to students who have taken History 32S. C-L: Comparative Area Studies. One course. *Richards*
- 133A. The Birth of Europe: Society and Culture, 200-900. (CZ)** Europe in the transition from the world of late antiquity to the varied civilizations of the Middle Ages; social, cultural, and political frameworks in the time of the Emperor Constantine and St. Augustine. The

barbarian invasion: practices and communities. The small-scale politics of dark-age Ireland, Spain, and the growth, consolidation, and demise of the Carolingian empire. Not open to students who have taken History 133. C-L: Medieval and Renaissance Studies. One course. *Peyroux*

**133C. British Isles in the Middle Ages. (CZ)** From the fifth through the fourteenth centuries. Not open to students who have taken History 134. C-L: Medieval and Renaissance Studies. One course. *Peyroux*

**134A. History of Jews in the Early Middle Ages. (CZ)** The period between A.D. 600 and A.D. 1000. The condition of Jews in Islamic land, their self-government, their legal status, and their economic activity; the messianic movements; the emergence of the Golden Age in Spain. C-L: Judaic Studies and Medieval and Renaissance Studies. One course. *Shatzmiller*

**134B. History of Jews in the Late Middle Ages. (CZ)** The period between the year A.D. 1000 and A.D. 1500. Jewish activity in western Europe; the church's attitude toward the Jews; their monetary activity and the history of their families and their private lives. C-L: Medieval and Renaissance Studies. One course. *Shatzmiller*

**135B. Germany from 1871 to 1933. (CZ)** Militarism, socialism, and feminism following the first unification; Weimar democracy in the aftermath of defeat; the popularity of Hitler in the context of the Depression. C-L: Comparative Area Studies. One course. *Koenz*

**135C. Germany from 1933 to 1990. (CZ)** The creation of the Nazi state, its propaganda, economic recovery schemes, and bio-political social organization. The war years, from the standpoint of the victims and perpetrators, to be examined through memoirs and psychological studies of the "holocaust kingdom." The postwar period: women's role in rebuilding Germany, de-Nazification and the Cold War in the East and West, and (based on journalists' accounts) "post-wall" Germany. The shape of public memory in "Bitburg history" and monuments to the victims of Nazi extermination. C-L: Comparative Area Studies. One course. *Koenz*

**136A. Introduction to Contemporary Latin American Reality. (CZ)** The complexity and diversity of factors which help to define the daily experience of Latin American reality for contemporary Latin Americans. Through cultural, academic, and government documents, issues ranging from ecology and energy policy in Brazil to human rights abuses and the experience of women in modern Latin America will be studied. Not open to students who have taken History 136. C-L: Comparative Area Studies and Latin American Studies. One course. *James*

**136B. Biography and Politics in Latin America. (CZ)** Key individuals who have shaped Latin American society and politics from Hernán Cortés to Fidel Castro. C-L: Comparative Area Studies and Latin American Studies. One course. *French*

**136C. Nineteenth-Century Latin America: Building Postcolonial Nations. (CZ, SS)** The period from the Wars of Independence to the First World War. Explores how nations and national identities were constructed in Latin America; focus on the importance of race, gender, and ethnicity. Conflicts between church and state, struggles over freedom and citizenship, and economic dependency and development. C-L: Comparative Area Studies and Latin American Studies. One course. *Staff*

**137. Comparative Approaches to Global Issues. (CZ, SS)** Not open to students who have taken Religion 121. See C-L: Comparative Area Studies 125; also C-L: Cultural Anthropology 125, Perspectives on Marxism and Society, Political Science 125, Religion 183, and Sociology 125. One course. *Staff*



**138. Renaissance and Reformation Germany. (CZ)** The interplay of social, economic, and political developments in Central Europe from the eve of the Reformation to the end of the Thirty Years' War, with particular attention to the links between religion, gender, and the social order. C-L: Comparative Area Studies and Medieval and Renaissance Studies. One course. *Robisheaux*

**139A. Radical Movements in Modern Asia. (CZ)** The emergence, interactions, and the nature of radical movements in Asian societies. Emphasis on identifying the character of Asian radical discourses as expressions of third world responses to modernity. One course. *Dirlik*

**139B. Modern South Asia. (CZ)** South Asian history from the rebellion of 1857 to independence and partition in 1947. Topics include the impact of colonial rule on the economy; politics and social formation of the subcontinent; the rise of nationalism; religion and politics; and the position of women. One course. *Kaiwar*

**141A. Crossroads of Eurasia: The History of Turkey. (CZ)** A study of the land which became modern Turkey as a crossroads of civilization, from ancient times to the present day. One course. *Neuschel*

**142A. China: Roots of Revolution. (CZ)** A survey of modern Chinese history with special emphasis on the nineteenth and twentieth centuries. Not open to students who have taken History 142. C-L: Comparative Area Studies and Perspectives on Marxism and Society. One course. *Dirlik or Mazumdar*

**142B. China since 1949: The People's Republic. (CZ)** The Chinese path to communism and the communist transformation of Chinese society. Not open to students who have taken History 139. C-L: Comparative Area Studies and Perspectives on Marxism and Society. One course. *Dirlik or Mazumdar*

**142C. Chinese Food in History. (CZ)** Food and food crops in historical perspective. Using literary sources and art, the course reconstructs the culture of food. One course. *Mazumdar*

**142E. Modern China in Film and Literature. (CZ, SS)** Focus on the contributions to historical understanding of nonhistorical texts. Differences in Chinese and non-Chinese representations; the effect of different media in representations; study of film versions of literary works. One course. *Dirlik*

**143A. Ancient and Early Modern Japan. (CZ)** Japan from earliest settlement to 1868; the Heian Court, rise of the samurai, feudal society and culture, the Tokugawa age, and the Meiji Restoration. Not open to students who have taken the former History 143. C-L: Comparative Area Studies. One course. *Wigen*

**143B. The Emergence of Modern Japan. (CZ)** Japan from Meiji to microchips. The Meiji settlement, industrialization and urban growth; political parties, social movements, and foreign policy in the imperial era; World War II and the American occupation; economic recovery. Not open to students who have taken the former History 144. C-L: Comparative Area Studies. One course. *Wigen*

**144A. The Crusades to the Holy Land. (CZ)** The crusades to the Holy Land and other manifestations of European expansionism, for example, the reconquest of Spain and the foundation of a Norman Kingdom in Sicily. One course. *Shatzmiller*

**145A, 145B. African-American History. (CZ)** The black experience in America from slavery to the present. C-L: African and African-American Studies 145A, 145B. One course each. *Gavins*

**146S. Introduction to Russian Civilization. (CZ)** See C-L: Russian 190S; also C-L: Comparative Area Studies. One course. *Pelech*

**148. Aspects of Renaissance Culture. (AL, CZ)** See C-L: Medieval and Renaissance Studies 115; also C-L: Art History 149, and Italian 125. One course. *Finucci, Rasmussen, Rice, Van Miegroet, and Witt*

**149. World Military History. (CZ)** Comparative study of war as a social institution in different times and cultures. Topics include the origins of war and war in ancient China, classical Greece, the Middle Ages, early modern Europe, colonial America, nineteenth-century Japan, the cold war, and Vietnam. One course. *Roland*

**150A. Documentary Film History. (AL, CZ)** The development of the nonfiction film from a historical perspective. Beginning in the silent period with the ethnographic films of Robert Flaherty; in the sound period, the work of John Grierson. Various schools such as cinema verite and direct cinema in the 1950s up to the present revival and rehabilitation of documentary. Technological changes and the use of documentary as a political organizing tool. C-L: Film and Video, Literature 117, Perspectives on Marxism and Society, and Political Science 198. One course. *Gaines, Paletz, or Wood*

**150B, S. American Communities: A Documentary Video Approach. (AL, SS)** Prerequisites: English 101A and any one of the following: Film and Video 100S, 101S, or 104S. See C-L: Film and Video 105S; also C-L: Cultural Anthropology 134S, Political Science 156S, and Public Policy Studies 105S. One course. *Staff*

**150C. Doing Documentary Work. (AL, SS)** See C-L: Public Policy Studies 178; also C-L: Visual Arts 178, and English 171. One course. *Coles and Harris*

**151A. The Intellectual Life of Europe, 1250-1600. (CZ)** Not open to students who have taken History 104. C-L: Comparative Area Studies and Medieval and Renaissance Studies. One course. *Witt*

**151E. European Intellectual History, 1848-1918. (CZ)** Contextual study of some major works in European social and political thought from the revolution of 1848 to the First World War. Readings in Mill, Taylor, Marx, Nietzsche, Freud, Durkheim, Weber, Lenin, Kollantai, and Gramsci, as well as in secondary interpretations and historical works. One course. *Hacohen*

**151F. European Intellectual History, 1918-1968. (CZ)** Contextual study of some major works in European social and political thought from the First World War to the Student Revolution. Readings in Schmitt, Arendt, Heidegger, Beauvoir, Wittgenstein, Berlin, Fanon, Foucault, and Habermas. One course. *Hacohen*

**152. The Modern Middle East. (CZ)** The historical development of the Middle East in the nineteenth and twentieth centuries. The emergence of nation-states in the region following World War I. C-L: Comparative Area Studies and Judaic Studies. One course. *Y. Miller*

**153. The Insurgent South. (CZ)** C-L: Perspectives on Marxism and Society. One course. *Goodwyn*

**154B, S. Upheavals That Made Modern France. (CZ, FL)** A study of the critical and violent moments in French history that redefined the modern French nation and society: the French Revolution, the revolution of 1848, and the two world wars. Taught in French. C-L: French 154S. One course. *Orr and Reddy*

**156A. The Reformation of the Sixteenth Century. (CZ)** Not open to students who have taken Religion 167. See C-L: Religion 158; also C-L: Comparative Area Studies, and Medieval and Renaissance Studies. One course. *Hillerbrand*

- 156B. History of the Christian Church. (CZ)** See C-L: Religion 120. One course. *Hillerbrand*
- 157A. Rise of Modern Science: Early Science through Newton. (CZ)** The development of science and medicine with attention to cultural and social influences upon science. Not open to students who have taken the former History 118. One course. *Mauskopf*
- 157C. Rise of Modern Science: Twentieth Century. (CZ)** See History 157A. Not open to students who have taken the former History 118. One course. *Mauskopf*
- 158A. New Perspectives on the Atlantic World. (CZ)** Reorients the histories of four continents. An exploration of how an Atlantic world arose because of the interactions among Africa, North America, South America, and Europe. How this Atlantic world originated in the fifteenth century; how people emigrated, by force or free will, from one continent to another (and often back again); how plants, animals, trade goods, and diseases crossed the ocean; how ideas—especially revolutionary ideas—arose from intercontinental contact and spread throughout the Atlantic world. Concludes that people of each of the Atlantic continents possess a heritage including the three other continents, and that this heritage was ocean-borne. C-L: African and African-American Studies 158A and Comparative Area Studies. One course. *Ewald*
- 160. The United States from the New Deal to the Present. (CZ)** C-L: Women's Studies. One course. *Chafe*
- 161. History of Modern Russia. (CZ)** Following a brief introduction to the medieval origins of the Imperial Russian state, the course will concentrate on the period between the reign of Catherine the Great (1762-1796) and the death of Lenin in 1924. Emphasis on state authority, ruling elites, and the formation of the opposition revolutionary movement leading to the Bolshevik seizure of power in 1917. Not open to students who have taken both History 161A and 161B. C-L: Comparative Area Studies. One course. *M. Miller*
- 163A. Sectional Conflict, Civil War, and Reconstruction: The United States, 1840-1880. (CZ)** The Civil War's origins, course, and aftermath. Focus on the politics of sectional strife, the social experience of modern war, explanations for the conflict's eventual outcome, economic and political consequences in both North and South, and the degree of change wrought by emancipation. One course. *Balliesen*
- 163B. The United States' Civil War and its Aftermath, 1861-1900. (CZ)** Emphasis on the political and social aspects of the war; only slight treatment of battles. Political, racial, and economic themes of the Reconstruction and Populist eras. One course. *Durden*
- 163C. The American Civil War. (CZ)** C-L: Perspectives on Marxism and Society. One course. *Goodwyn*
- 164. India, Pakistan, and Bangladesh: 1750 to the Present. (CZ)** Social and economic impact of Western rule, development of nationalism and independence. C-L: Comparative Area Studies. One course. *Richards*
- 165. History of the Working Class in the United States. (CZ)** A social history of the working class, as well as a political history of labor, from the early nineteenth century to the present. Not open to students who have taken History 106. C-L: African and African-American Studies 165 and Perspectives on Marxism and Society. One course. *Keyssar*
- 166. History of the Sahara. (CZ)** Focus on topics such as the ecological transformation of the Sahara, the role of Saharans in the rise of ancient Egypt, the introduction of the camel and caravan organization, the life of the nomads, the spread of Islam, Berber dynasties, Ibn Khaldun's theory of Saharan society, the Saharan golden age, Sudanese kingdoms, the states of the great Nile Valley, economics and the spreading Sahara, European penetration,

Napoleon in Egypt, the French orientalist, the trans-Saharan slave trade, and women in the Sahara. C-L: African and African-American Studies 166. One course. *El Hamel*

**167A. United States Foreign Policy I: From World War I to Vietnam War.** (CZ, SS) See C-L: Public Policy Studies 169A. One course. *Kuniholm*

**167B. United States Foreign Policy II: From Vietnam War to the Present.** (CZ, SS) See C-L: Public Policy Studies 169B. One course. *Kuniholm*

**169A. American Women, 1600-1877.** (CZ) C-L: Study of Sexualities and Women's Studies. One course. *Hewitt*

**169B. American Women, 1877 to the Present.** (CZ) C-L: Study of Sexualities and Women's Studies. One course. *Hewitt*

**170C. Afro-Brazilian Culture and History.** (CZ) Slavery and the post-emancipation trajectory of Afro-Brazilians in a racist society which officially proclaims itself a "racial democracy." Comparisons drawn with the Afro-American experience elsewhere in Latin America and the United States. C-L: African and African-American Studies 170 and Latin American Studies. One course. *French*

**171A. History of Women in Early Modern Europe.** (CZ) Women in Europe from medieval times to 1800 with attention to economic, social, and intellectual experience. C-L: Comparative Area Studies and Women's Studies. One course. *Neuschel*

**172B. China and the West.** (CZ) Survey course with overview of the pre-nineteenth-century Western contacts with China (for example, the French Physiocrats and European idealization of China, early American and English trade). Focus on nineteenth-century topics such as the Opium Wars, British and French imperialism, the efforts to import western technology into China by Westerners, and twentieth-century matters such as the impact of the Russian Revolution and Euro-American foreign policy towards China, concluding with Nixon's visit to China in 1972 and the re-establishment of Sino-American foreign relations. One course. *Mazumdar*

**172C. China from Antiquity to 1400.** (CZ) Beginning with the early neolithic cultures, focus on the evolution of Han civilization, the formation of the imperial state system in China, ecological adaptations and foundations of the agrarian economy, the coming of Buddhism to China, and China's contacts with other peoples and regions of Asia up to A.D. 1400. One course. *Mazumdar*

**174B. Modern Latin America.** (CZ) A survey of nineteenth- and twentieth-century economic, social, and cultural change. Not open to students who have taken History 177. C-L: Comparative Area Studies and Latin American Studies. One course. *Staff*

**175S. The Southern Plantation as Historical Laboratory: Odyssey in Black and White, 1770-1970.** (CZ) Readings and discussion on the plantation as a microcosm of Southern social history since 1770, emphasizing the parallel evolution of black and white communities, families, economies, cultures, perceptions, and power struggles. C-L: African and African-American Studies 175S. One course. *Nathans*

**177A. American Constitutional Development I.** (SS) See C-L: Political Science 177. One course. *Fish*

**178A. Science and Technology in the Ancient World.** (CZ) See C-L: Classical Studies 101. One course. *Rigsby*

**180. The Soviet Experience.** (CZ) A survey of the history of Russia and the Soviet Union from the eve of the Revolution to the present day with particular emphasis on political, social,



and cultural change and continuity. Not open to students who have had History 262. C-L: Comparative Area Studies. One course. *Lerner*

**182C. History of Greek and Roman Civil Law. (CZ)** Not open to students who have taken History 103. See C-L: Classical Studies 102. One course. *Oates*

**183S. Canada from the French Settlement. (CZ)** Problems in the development of Canada and its provinces. C-L: Canadian Studies and Comparative Area Studies. One course. *Thompson*

**184S. Canadian Issues. (SS)** Prerequisite: Canadian Studies 98 or consent of instructor. See C-L: Canadian Studies 184S; also C-L: Comparative Area Studies, Cultural Anthropology 184S, Economics 184S, Political Science 184S, and Sociology 184S. One course. *Staff*

**185A. Socialist Realism: Soviet Literature of the 1930s and 1940s. (AL)** See C-L: Russian 182; also C-L: Comparative Area Studies, and Perspectives on Marxism and Society. One course. *Lahusen*

**186. Marxism and Society. (SS)** See C-L: Cultural Anthropology 139; also C-L: Comparative Area Studies, Education 139, Literature 181, Perspectives on Marxism and Society, and Sociology 139. One course. *Staff*

**188A. Genocide in the Twentieth Century. (CZ)** Focus on four cases in which soldiers have launched murderous attacks against civilians: Turks against Armenians, Nazis against Jews and other racial enemies, Khmer Rouge against their Cambodian enemies, and "ethnic cleansing" in Yugoslavia. Examines responsibility of both perpetrators and bystanders. One course. *Koonz*

**189B. History of Public Health in America. (CZ)** The role of epidemic diseases such as smallpox, cholera, yellow fever, tuberculosis, and polio in shaping public health policy in the United States from the colonial era to World War II. One course. *Humphreys*

**190. The History of Women in Science and Medicine. (CZ)** The history of scientific and medical theories about women and an analysis of women as participants in the evolution of science and medicine. C-L: Women's Studies. One course. *Green*

**193, 194. Introduction to the Civilizations of Southern Asia. (CZ)** Not open to students who have taken Religion 160, 161. See C-L: Asian and African Languages and Literature 160, 161; also C-L: Comparative Area Studies, Cultural Anthropology 101, 102, and Religion 144, 145. One course each. *Khanna*

## **SMALL GROUP LEARNING EXPERIENCES**

### **Independent Study**

Independent study is usually undertaken by students concurrently with the Honors Seminar or with an instructor with whom they have had a course. A proposal for independent study should include a detailed description and a list of the proposed readings. The form must be signed by the instructor and the director of undergraduate studies.

**191, 192. Independent Study.** One course each. *Staff*

### **Undergraduate Seminars**

See also History 21S, 22S, 49S, 91S, 92S, 93S, 105S, 106S, 123S, 124S, 140S, 141S, 154B,S, 159S, 167S, 168S, 175S, 176S, 183S, 184S.

**195S, 196S. Junior-Senior Seminars in Special Topics. (CZ)** Opportunities for juniors and seniors to research and write about a specific historical question. Topics are numerous and

vary each semester. Most seminars are offered for one semester and carry one course credit; some seminars are offered for year-long study and carry two course credits. If students wish to enroll in only one semester of a year-long seminar, they must obtain permission from the instructor. Both history majors and nonmajors may enroll in the seminars during their junior or senior years. Students are urged to enroll in their junior year if they expect to apply for the Senior Honors Seminar (History 197S-198S) or to practice-teach in their senior year. One course each. *Staff*

### Honors Seminars

**197S-198S. Senior Honors Seminar. (CZ)** Designed to introduce qualified students to advanced methods of historical research and writing, and to the appraisal of critical historical issues. Open only to seniors, but not restricted to candidates for graduation with distinction. This course, when taken by a history major, is accompanied by either a year-long 195S-196S seminar, two courses at the 200 level, or 191-192 independent study, supervised by an instructor. Two courses. *Staff*

### ADVANCED COURSES (FOR SENIORS AND GRADUATES)

**201S. The Russian Intelligentsia and the Origins of the Revolution. (CZ)** Origin and dynamics of the Russian revolutionary movement, the intelligentsia, and the emergence of the labor movement. C-L: Comparative Area Studies. One course. *M. Miller*

**202S. The Russian Revolution. (CZ)** An analysis of the Bolshevik seizure of power in 1917 and the establishment of a revolutionary society and state during the 1920s. C-L: Comparative Area Studies. One course. *M. Miller*

**203. Topics in Modern World Environmental History. (CZ)** Human effects upon the natural environment; case studies and a synthetic global perspective. One course. *Richards*

**207A, S. Geographic Perspectives in History I: Atlantic Worlds. (SS)** A variety of geographical perspectives in history, drawing on studies of western Europe, North America, and the north Atlantic basin. Analysis of maps and atlases, as both tools and objects of historical inquiry. Major themes include: maps and power; contact, conquest, and the "creative destruction" of landscapes; the spatial logics of capital; geographies of identity; the production of regions; and historical-geographic perspectives on modernity. C-L: Comparative Area Studies. One course. *Wigen*

**207B, S. Geographic Perspectives in History II: Asian and Pacific Worlds. (SS)** A broad range of spatial, regional, environmental, and landscape approaches to Asian history. Major themes include: orientalism and the search for "Asia"; Asian history as world history; the formation of local, regional, and national identities; indigenous cartographies; state-making and boundary-making; and the conceptual shift from "Asia" to "Pacific." C-L: Comparative Area Studies. One course. *Wigen*

**208A, S. Decentering the Cultural Map: Boundary Zones as Counter-Cores. (CZ, SS)** Focus on those parts of the globe most often overlooked in conventional area-studies courses: the boundary zones between major world regions. The extent to which so-called "natural barriers" of oceans, deserts, steppes, and mountain ranges have historically fostered communication, creating interstitial spaces for experimentation, exchange, and cultural resistance. C-L: Comparative Area Studies. One course. *Lewis and Wigen*

**209S. Race, Class, and Gender in Modern British History. (CZ)** The intersection between gender, race, and class identities in British history since the eighteenth century. The parallels and overlaps as well as the disjunctures and distinctions between these different modes of power in a period of tremendous economic, social, and political change resulting from industrialization and imperial expansion. Questions and issues include the impact of

industrialization on gender as well as class consciousness, the role of women, the middle classes and the working classes in the campaign against slavery, British workers' reactions to the "scramble" for colonies, the attitudes and activities of British women in the empire, and sexuality and the evolution of racist discourse. C-L: African and African-American Studies 209S and Study of Sexualities. One course. *Thorne*

**210S. Anthropology and History. (SS)** Prerequisites: major in history, one of the social sciences, or comparative area studies; or graduate standing. See C-L: Cultural Anthropology 207S. One course. *Reddy*

**211A. History of Medicine in the Southern United States. (CZ)** The social history of disease and medical practice in the southern United States from the colonial era to World War II. Topics will include the impact of disease on the region's settlement and economy, slave health, the role of "alternate practitioners," and the growing federal presence in the post-Reconstruction South. One course. *Humphreys*

**214. Class, Public Opinion, and the French Revolution. (CZ)** The current state of the ongoing controversies over the origins and character of the first modern social revolution. C-L: Comparative Area Studies. One course. *Reddy*

**218. Problems in British Imperialism. (CZ)** Selected readings on significant aspects of the history of the British Empire-Commonwealth: for example, Ireland, South Africa, and India. One course. *Cell*

**221. Special Topics in the History of Europe, 1200-1700. (CZ)** Investigation of selected aspects of the economic, social, and cultural history of premodern Europe. Topics have included the social history of religion, gender and society, and traditional society and the origins of capitalism. C-L: Comparative Area Studies and Medieval and Renaissance Studies. One course. *Neuschel or Robisheaux*

**222A. Problems in the Intellectual History of the European Renaissance and Reformation. (CZ)** Prerequisites: History 151A and reading knowledge of German, French, or Italian. C-L: Medieval and Renaissance Studies. One course. *Witt*

**222B. Florence: Renaissance City. (CZ)** C-L: Medieval and Renaissance Studies. One course. *Witt*

**222C, S. Petrarch. (CZ)** Focuses on the major works of fourteenth-century Italian humanitarian, Francesco Petrarch. One course. *Witt*

**223S, 224S. The World Wars. (CZ)** The causes, course, and consequences of World Wars I and II, from military, political, and economic perspectives; the legacy of World War II; special emphasis on understanding the experience of total war—not only for the individual soldier but for whole societies. One course each. *Biddle*

**225S. Problems in Comparative Labor History. (SS)** Common dilemmas and varying solutions in the cross-national development of labor-management relations, their political implications, and their larger historical significance. C-L: Comparative Area Studies and Latin American Studies. One course. *French or Keyssar*

**226. Topics in the Labor History of the United States. (SS)** One course. *Keyssar*

**230S. Populism in Latin America. (CZ)** An examination of the various theoretical frameworks developed for Latin American populism, followed by case studies focusing on issues such as the emergence of a modernizing state, the role of the masses in populist movements, and the class content and ideological and cultural parameters of such movements. C-L: Comparative Area Studies and Latin American Studies. One course. *James*

**232A, S. Historical and Anthropological Approaches to Emotion. (CZ)** Examines emotion as a collective and historical phenomenon prompted by dissatisfaction with rigid notions of culture and current concern about the social construction of the self and identity. C-L: Cultural Anthropology 232S. One course. *Reddy*

**233S. Slave Resistance and Social Control in New World Societies. (CZ)** The operation of slave societies in the Americas from the sixteenth to the nineteenth centuries focusing on master-slave relations and slave resistance. C-L: African and African-American Studies 233S, Comparative Area Studies, and Latin American Studies. One course. *Gaspar*

**234S. Political Economy of Development: Theories of Change in the Third World. (SS)** See C-L: Political Science 234S; also C-L: Comparative Area Studies, Cultural Anthropology 234S, and Sociology 234S. One course. *Staff*

**235S. The Antebellum South. (CZ)** The economic, political, and social aspects of life in the South, 1820-1860. C-L: African and African-American Studies 235S. One course. *S. Nathans*

**236A. Topics in the History of Monasticism. (CZ)** The development of western medieval monasticism from its third-century origins in the Egyptian desert through the twelfth-century explosion of devotional communities. Varied topics include monastic anxiety and optimism about the nature of the human will; the origins, meaning, and practical experience of vows to poverty, chastity, stability, and obedience; and the growth of a monastic culture. Designed to guide advanced students through the professional study of monastic institutions and monastic historiography. French, German, or Latin necessary. C-L: Medieval and Renaissance Studies. One course. *Peyroux*

**238S. Europe in the High Middle Ages. (CZ)** Western Europe; the agricultural revolution, the re-emergence of city civilization, and the strengthening central governments and bureaucracies. Not open to students who have taken History 133B. C-L: Medieval and Renaissance Studies. One course. *Shatzmiller*

**239. History of Socialism and Communism. (CZ)** The origins and development of socialist and communist movements from pre-Marxian times to the present. Not open to students who have taken History 120. C-L: Comparative Area Studies. One course. *Lerner*

**240A. Multinationalism and Multiculturalism: Eastern Europe Example. (CZ)** One course. *Lerner*

**241A, S. The Origins of Totalitarianism, 1924-1954. (CZ)** The development of the concept of totalitarianism over three decades. Responses to Italian Fascism, German National Socialism, and Soviet Stalinism among European intellectuals. Early theoreticians of totalitarianism: Halévy, Schmitt, Marcuse, Voegelin, Hilferding, Neumann, Hayek, Popper, Arendt, and Friedrich; critiques of the scholarly and ideological uses of totalitarianism. One course. *Hacohen*

**242B. The Soviet 1920s: The Road to a New Synthesis. (AL)** See C-L: Russian 281. One course. *Lahusen*

**248. History of Modern India and Pakistan, 1857 to the Present. (CZ)** C-L: Comparative Area Studies. One course. *Richards*

**251A. Topics in Intellectual History of Europe, 1250-1450. (CZ)** C-L: Medieval and Renaissance Studies. One course. *Witt*

**251B. Topics in Intellectual History of Europe, 1450-1650. (CZ)** C-L: Comparative Area Studies and Medieval and Renaissance Studies. One course. *Witt*



**252A. Construction of China in European and American Literature. (CZ)** An examination, starting with Marco Polo's account of China, of representations of China in Euro-American writing toward an understanding of a Euro-American discourse on China. Emphasis on fiction, but consideration as well of the relationship between fictional and nonfictional writing (especially history, geography, and travelogue). While the approach is historical, contemporary representations of China are of primary concern. Not open to students who have taken History 252. One course. *Dirlik*

**252B. Culture and Society in Contemporary China. (CZ)** Developments in Chinese society and culture since 1978, focusing on social changes in China and on matters of culture. Culture here includes debates on culture and history, as well as various forms of cultural production (literature, film, and popular culture). Parallel developments in Pacific Asia (Japan, Taiwan, and Hong Kong, in particular). One course. *Dirlik*

**255A. S. Development of United States Courts of the Fourth Circuit. (SS)** Consent of instructor required. See C-L: Political Science 238S; also C-L: Law 548S. One course. *Fish*

**255B. War and the National State. (SS)** No prerequisite, but Political Science 93 recommended. See C-L: Political Science 288. One course. *Goemans*

**256. Modern Literature and History. (AL, CZ)** See C-L: French 256; also C-L: Comparative Area Studies. One course. *Kaplan, Orr, or staff*

**260. Fifth and Fourth Century Greece. (CZ)** See C-L: Classical Studies 222. One course. *Oates or Rigsby*

**261. The Hellenistic World. (CZ)** See C-L: Classical Studies 223. One course. *Oates*

**262. The Soviet Experience. (CZ)** A survey of the history of Russia and the Soviet Union from the eve of the Revolution to the present day with particular emphasis on political, social, and cultural change and continuity. Not open to students who have had History 180. C-L: Comparative Area Studies. One course. *Lerner*

**263. The Roman Republic. (CZ)** See C-L: Classical Studies 224. One course. *Boatwright or Rigsby*

**264. The Roman Empire. (CZ)** See C-L: Classical Studies 225. One course. *Boatwright*

**268S. England in the Seventeenth Century. (CZ)** C-L: Comparative Area Studies and Medieval and Renaissance Studies. One course. *Herrup*

**272S. Fin-de-siècle and Interwar Vienna: Politics, Society, and Culture. (CZ)** The cultural milieu of fin-de-siècle and interwar Vienna. Freud, Kraus, the Austro-Marxists, Neurath, the Austrian School of Economics, Wittgenstein, the Logical Positivists, Popper, and Musil; monographs on Viennese culture (Schorske), feminism, and Austrian socialism. One course. *Hacohen*

**273S, 274S. Topics in the History of Science. (CZ)** Critical stages in the evolution of scientific thought. One course each. *Mauskopf*

**275S. Asian and Asian-American Women in Comparative Perspective. (CZ)** A woman-centered approach to the history of colonialism and nationalist struggles in Asia, the evolution of racialist discourse and its impact on Asian immigration to the United States. One course. *Mazumdar*

**276A. Asian-American Experience. (CZ)** History of Asian Americans in the United States to World War II, focusing on immigration, conditions in the homeland which fostered

immigration, and the legislative barriers such as the exclusion acts which prevented the immigration of Asians. The United States in the context of a global political economy; the impact of colonialism and imperialism in the shaping of Asian-American experience. One course. *Mazumdar*

**277S. The Coming of the Civil War in the United States, 1820-1861. (CZ)** One course. *Staff*

**278S. The Civil War in the United States and Its Aftermath, 1861-1900. (CZ)** One course. *Staff*

**279, 280. Health, Healing, and History. (CZ)** The development of medicine within the broader cultural context from prehistory to the twentieth century. One course each. *English*

**281S. United States' Diplomacy since 1945. (CZ)** C-L: Canadian Studies. One course. *Staff*

**282S. Canada. (SS)** See C-L: Canadian Studies 282S; also C-L: Comparative Area Studies, Cultural Anthropology 282S, Economics 282S, Political Science 282S, and Sociology 282S. One course. *Staff*

**283S. Seminar in North American Studies. (CZ)** See C-L: North American Studies 283S; also C-L: Cultural Anthropology 283S, Political Science 285S, Public Policy Studies 282S, Romance Studies 283S, and Sociology 283S. One course. *Staff*

**287S. American History and Social Theory. (CZ)** Contemporary theories of social order, social change, and revolution. One course. *Goodwyn*

**288S. Germany and Japan in World War II. (CZ)** A comparative inquiry into the experience of these two capitalist "late developing" nations that turned to fascism and militarism in the 1930s. Topics include business and the state in wartime mobilization, wartime labor and productivity, the experience of women at work and at home, impact of firebombings, wartime propaganda and racism, postwar memory of the wartime era. One course. *Koonz*

**289S. War, Revolution, and Society in the Caribbean 1700-1815. (CZ)** Explores the complex impact of European imperialism and the American, French, and Haitian revolutions upon Caribbean societies to the end of the Napoleonic wars. Military, economic, social, political, and institutional theories examined. One course. *Gaspar*

**292. Research Methods in Japanese. (SS)** Consent of instructor required. See C-L: Japanese 291; also C-L: Cultural Anthropology 290, Political Science 291, and Sociology 291. One course. *Staff*

**293. French Liberalism: An Intellectual History, 1815-1981. (CZ)** Historical study of major French liberal thinkers in their political, social, and intellectual contexts. Readings in De Staël, Constant, Guizot, Tocqueville, Durkheim, Halévy, and Aron and historiography. Major themes: revolution, restoration, and liberalism's origins; liberals, the July Monarchy, and 1848; Durkheim, the Third Republic, and the new liberalism; World War I, totalitarianism, and contemporary French liberalism. One course. *Hacohen*

**294S. Women and Medicine in the United States. (CZ)** The history of women as patients and practitioners from the colonial era to the present. The concept of "practitioner" broadly defined, to include domestic medicine, midwives, nurses, physicians, and other "alternative" medical women. Themes include birth control, women's control of their own bodies, sources of authority for medical practice, race and health, and the underlying general history of medicine in the United States. One course. *Humphreys*

**295S. Slavery and Freedom in Africa, to 1960. (CZ)** How Africans created variations on the global themes of servility, slavery, and freedom. Includes various forms of slavery in Africa; gender and slavery; slave trades; the impact of the Atlantic economy on slavery in Africa; colonial policies of "emancipation," labor control, and labor coercion; African intellectual

responses to the problem of slavery and African expressions of freedom, including freedom from colonial rule. C-L: African and African-American Studies 292S and Comparative Area Studies. One course. *Ewald*

296. United States Policy in the Middle East. (SS) See C-L: Public Policy Studies 257; also C-L: Comparative Area Studies. One course. *Kuniholm*

299. Lectures in Special Topics. (CZ) Lectures in advanced topics, designed for seniors and graduate students. In some semesters open to seniors and graduate students; in other semesters limited to graduate students only. One course. *Staff*

299S. Special Topics. (CZ) Seminars in advanced topics, designed for seniors and graduate students. Some semesters open to seniors and graduate students; some semesters limited to graduate students only. One course. *Staff*

## COURSES CURRENTLY UNSCHEDULED

101H. Structures, Science, and Society. (CZ)

101N. The Social History of Alcohol. (CZ)

114B. Immigration, Migration, and Mobility of Labor: United States and the World. (CZ)

121C. American Diplomacy since 1941. (CZ)

122B. Japan: Population, Resources, and Development, 1600-1940. (CZ)

128. Comparative Social Movements. (CZ)

131A. History of Mexico and the Caribbean in the Nineteenth and Twentieth Centuries. (CZ)

135A. Germany from the Thirty Years' War to Unification in 1871. (CZ)

151C. European Intellectual History, 1789-1848. (CZ)

154A. Society and the State in France, 1700 to the Present. (CZ)

154D. The French Revolution at 200 Years. (CZ)

155. Mexico From Pre-Columbian Times to the Present. (CZ)

157B. Rise of Modern Science: Eighteenth to the Twentieth Century. (CZ)

159S. The Palestine Problem and United States Public Policy. (CZ)

162A. Diplomatic Relations in the Western Hemisphere. (CZ)

168S. The Atlantic Slave Trade. (CZ)

171B. History of Women in Modern Europe. (CZ)

172A. Comparative Perspectives on Women in Asia, Africa, and the Middle East. (CZ)

173. History of Spain from Late Medieval Times to the Present. (CZ)

174A. History of Colonial Hispanic America from Pre-Columbian Times to the Wars of Independence. (CZ)

176S. The Southern Plantation as Historical Laboratory: Research Seminar. (CZ)

179. History of South Africa, 1600-1960. (CZ)

181. Alexander the Great. (CZ)

187. History and Religions of North Africa. (CZ)

189A. Medicine in the West. (CZ)

204. German Society, 1914-1945. (CZ)

205S. Gender and War. (CZ)

206. Origins of Afro-America. (CZ)

212. The American Indian in the Revolutionary Era, 1760-1800. (CZ)

213S. Early Modern France. (CZ)

215S. The United States in International Relations: The Eighteenth and Nineteenth Centuries. (CZ)

216S. United States Diplomacy, 1890-1945. (CZ)

217. Problems in American Colonial History. (CZ)

219S, 220S. History of Science and Technology. (CZ)

227-228. Recent United States History: Major Political and Social Movements. (CZ)  
 231S. Readings in Latin American Colonial History. (CZ)  
 237S. Europe in the Early Middle Ages. (CZ)  
 243-244. Marxism and History. (SS)  
 245, 246. Social and Intellectual History of China. (CZ)  
 247. Mughal India. (CZ)  
 249-250. Social and Intellectual History of the United States. (CZ)  
 253S, 254S. European Diplomatic History, 1871-1945. (CZ)  
 257. Comparative Latin America Labor. (CZ)  
 258S. Social Conflict in Weimar and Nazi Germany. (CZ)  
 259. Archaic Greece. (CZ)  
 265S. Problems in Modern Latin American History. (SS)  
 266. Late Antiquity. (CZ) 267S. England in the Sixteenth Century. (CZ)  
 269S-270S. British History, Seventeenth Century to the Present. (CZ)  
 271S. The Law of War. (CZ)  
 285S, 286S. Oral History. (SS)  
 290S. Theoretical Bases of Social Interpretation. (SS)

## THE MAJOR

The history major has two basic objectives. First, it seeks to offer students broad exposure to the histories of our own and other societies, to the recent and the more distant past, and to the variety of approaches to the study of history. Second, it seeks to allow study in depth of the history of a particular time and place, or a particular type of history. The goal of breadth is addressed in the distribution requirements for coursework across three geographic areas and in premodern as well as modern history. Depth is achieved through the requirement that students identify a primary field of study.

*Major Requirements.* Ten history courses, two at the introductory level (that is, 21, 22; 21D, 22D; 21S, 22S; 22X, 25, 26, 53, 54, 75, 76, 91, 92; 91D, 92D; 91S, 92S; 92X, 93S) and eight at the 100 level or above.

The ten courses are to be distributed as follows:

1. At least two courses in each of three out of the four geographic areas listed below.
2. At least four courses in the student's primary field of history. One of these must be a research seminar.

The eight 100-level and above courses are to be distributed as follows:

1. At least two upper-level pre-modern history courses (pre-1800).
2. At least two research seminars. (History 195S, History 196S, or 200-level courses.) Substitution of other seminars must be approved by the director of undergraduate studies and the instructor.

Geographic Areas are (1) United States and Canada; (2) Europe (including Britain and Russia); (3) Latin America and Caribbean; (4) Africa, Middle East, Asia. In cases of global or comparative courses, consult the history major's handbook or contact the Office of Undergraduate Studies.

*Pre-1800 courses:* See History 55, 57 (100A-100S, 103, 104, 105S, 106S Applicable sections); 107A, 111A, 111B, 113B, 114A,S, 115A, 116, 117, 119A, 121A, 124S, 126S, 127A, 127B, 131B, 133A, 133B, 133C, 134A, 138, 141A, 143A, 144A, 145A, 148, 151A, 155, 156A, 156B, 157A, 158A, 166, 172C, 173, 178A, 179, 182C, 183S, 189A, 190; (191, 192, 195S, 196S Applicable sections); 211A, 213S, 214, 217, 219S, 221, 222A, 222B, 222C,S, 231S, 233S, 236A, 237S, 238S, 251A, 251B, 259, 260, 261, 263, 264, 267S, 268S, 279, 289S, 294S, 295S; (299, 299S Applicable sections).

The primary field is defined as any one of the four geographic areas. In addition, a thematic area can serve as a primary field. Examples of thematic areas are (1) history of the



African diaspora, (2) history of labor, (3) history of medicine, science, and technology, (4) history of women, (5) military history. Students may define other thematic areas, with approval of the director of undergraduate studies and the student's advisor.

*Double counting:* Courses can fulfill two or more requirements. For example, History 21 would count as "introductory," as "European," and for a student with primary focus on Europe, would count toward the primary area requirement. However, introductory courses outside of the FOCUS program do not count toward the pre-1800 requirement.

*Advanced Placement:* A student may receive course credit toward graduation for Advanced Placement history courses but the history department does not count Advanced Placement credits toward the requirements for the history major.

*Transfer Credit.* At least eight of the ten courses required for the history major must be taken at Duke.

*Foreign Languages.* Majors interested in a particular area of study benefit from knowledge of the language of that area. Majors who contemplate graduate work are reminded that a reading knowledge of one or more foreign languages is required.

*Majors Planning to Teach.* Majors who plan to teach in secondary schools should consult an advisor in education. Rising juniors who intend to practice-teach in the senior year should take the 195S-196S or 197S-198S seminars or 200-level courses as juniors.

*Graduation with Distinction.* Any student who is qualified (see the section on honors in this bulletin) may apply to the director of undergraduate studies for permission to undertake work leading to a degree with distinction in history.

## THE MINOR

The history minor offers students specializing in another department or program the opportunity to enrich their studies with an historical perspective. The minor requirements are a minimum of five history courses, at least three of which must be at the 100 level or above. Courses taken pass/fail or Advanced Placement credits do not count toward the minor; one transfer course may count toward the requirements for the minor.

## House Courses (HC)

House courses, offered in the fall and spring terms, are intended to provide academic experiences that are not offered by regular departmental courses. A house course must be hosted by a residential unit, sponsored by a faculty member in Trinity College of Arts and Sciences, reviewed by the department of that faculty member, and approved by the Committee on Courses of Instruction of the Arts and Sciences Council. House courses carry a half-course credit. In the School of Engineering, house courses cannot be used to meet degree requirements. In Trinity College, not more than two semester-course credits earned in house courses can be counted toward the course requirement for graduation. House courses do not count toward other requirements. Grades are submitted only on the pass/fail basis. Further details are available in 04 Allen Building.

**179. House Course.** Special topics course in fall semester. Information about specific offerings each term available in 04 Allen Building. Pass/fail grading only. Half course. *Staff*

**180. House Course.** Special topics course in spring semester. Information about specific offerings available each term in 04 Allen Building. Pass/fail grading only. Half course. *Staff*

# Human Development (HDV)

Professor Gold, *Director*

A certificate, but not a major, is available in this program.

The goal of this interdisciplinary program is to broaden and enhance the perspectives of students interested in human development. The program seeks to foster an understanding and appreciation of how biological, psychosocial, and cultural factors act together in development throughout the life course. It also highlights the ways in which different disciplines conceptualize and study development, demonstrates the complementarity of disciplinary perspectives, and facilitates dialogue among faculty and students.

Achievement of the program's goal is facilitated by an integrated curriculum of required and elective courses including a research apprenticeship, a senior seminar, and other special events. An active advisory procedure assists students in planning learning opportunities. A certificate is available for students who complete program requirements. Participation in selected parts of the program and in the advisory system, however, is available to all undergraduates whether or not they seek the certificate.

For the program certificate, the curriculum includes two elective courses and four required courses. The required courses, which are described below, are Human Development 124 (Human Development); *either* Human Development 180 (Psychosocial Aspects of Development) *or* Psychology 159S (Biological Psychology of Human Development); Human Development 190 (Research Apprenticeship in Human Development); and Human Development 191S (Senior Seminar in Human Development).

Two elective courses are to be chosen from an illustrative list of biological, psychological, and social science courses affiliated with the program published in the program brochure. This list of elective courses includes Human Development 192S (Special Topics in Human Development).

The research apprenticeship arranged through the program and the related senior seminar are ordinarily available only to students seeking the program certificate. Other components of the program are available to all undergraduates.

## HUMAN DEVELOPMENT COURSES

**124. Human Development. (SS)** Biological, behavioral, and cultural perspectives and approaches. Multidisciplinary. Especially for sophomores. Juniors and seniors by consent only. C-L: Psychology 124 and Sociology 124. One course. *Gustafson, Maxson, or staff*

**180. Psychosocial Aspects of Human Development. (SS)** Traces biological, cultural, behavioral, and social components of normal development throughout the human life span, with society as the context in which individuals develop over time. Introductory work in anthropology, psychology, or sociology recommended. C-L: Psychology 130 and Sociology 169. One course. *Gold*

**190. Research Apprenticeship in Human Development.** Part of the Undergraduate Program in Human Development. Supervised work may be in a laboratory, project, or organizational setting. Consent of instructor required. One course. *Gold and staff*

**191S. Senior Seminar in Human Development. (SS)** Part of the Undergraduate Program in Human Development. Consent of instructor required. One course. *Gustafson and staff*

**192S. Special Topics in Human Development. (SS)** Part of the Human Development Program. Selected theoretical and methodological topics with emphasis on social change and public leadership in aging societies. One course. *Staff*

## OTHER COURSES

### Psychology

159S. Biological Psychology of Human Development (B, D, P). *Thompson*

## Immunology

For courses in Immunology, see Medicine (School)—Graduate (School) Basic Science Courses Open to Undergraduates.

## Italian

For courses in Italian, see Romance Studies.

## Japanese

For courses in Japanese, see Asian and African Languages and Literature.

## Judaic Studies (JUD)

Associate Professor Bland (religion), *Director*; Professors Mendelsohn (history), C. Meyers (religion), E. Meyers (religion), and Shatzmiller (history); Assistant Professor Zakim (Asian and African languages and literature)

A certificate, but not a major, is available in this program.

This program is sponsored by the interdisciplinary Duke Center for Judaic Studies. Participating departments and programs include Asian and African Languages and Literature, Comparative Area Studies, Cultural Anthropology, English, Germanic Languages, History, Medieval and Renaissance Studies, Political Science, Religion, and Women's Studies. A full range of courses is available in classical and modern Hebrew as well as Yiddish. Also, relevant courses in Judaic Studies may be taken at nearby UNC-Chapel Hill.

The certificate program offers students the flexibility to design, with the aid of a faculty advisor, a curriculum that meets individual interests and talents. Six courses are required. They include Religion 40 (Judaism) and at least one additional relevant course in Religion; two courses in either History or Asian and African Languages and Literature and one in the other; one additional course drawn from the list below or approved by the director of the program.

### Asian and African Languages and Literature

183S. Modern Hebrew Literature in English Translation. *Zakim*

### Classical Studies

99. Perspectives in Archaeology. (Cross-listed.) *C. Meyers, E. Meyers, Younger, and staff*

### Hebrew

1, 2. Elementary Modern Hebrew. *Zakim*

63, 64. Intermediate Modern Hebrew. *Zakim*

125S, 126S. Advanced Modern Hebrew. *Zakim*

191, 192, 193, 194. Independent Study. *Staff*

### History

134A. History of Jews in the Early Middle Ages. (Cross-listed.) *Shatzmiller*

152. The Modern Middle East. (Cross-listed.) *Y. Miller*

### Religion

40. Judaism. (Cross-listed.) *Staff*

100. The Old Testament/Hebrew Bible. *C. Meyers, E. Meyers, Peters, or Winternute*

101A. Selected Studies in the Bible: Pentateuch. *Staff*

101B. Selected Studies in the Bible: Prophets. *Staff*

101C. Selected Studies in the Bible: Writings. *Staff*

109. Women in the Biblical Tradition: Image and Role. (Cross-listed.) *C. Meyers*

115-116. Introduction to Biblical Hebrew. *Staff*

133. The Foundations of Post-Biblical Judaism. *E. Meyers*

134. Jewish Mysticism. (Cross-listed.) *Bland*

135. Jewish Religious Thought. (Cross-listed.) *Bland*

136. Contemporary Jewish Thought. (Cross-listed.) *Bland or E. Meyers*

175. Archaeology and Art of the Biblical World. (Cross-listed.) *C. Meyers or E. Meyers*

176. Principles of Archaeological Investigation. *C. Meyers or E. Meyers*

177. Perspectives in Archaeology. (Cross-listed.) *C. Meyers, E. Meyers, Younger, and staff*

- 195B, 196B. Junior-Senior Seminars: Traditions, Texts, and Contexts. *Staff*  
207. Hebrew Prose Narrative. (Cross-listed.) *Staff*  
208. Classical Hebrew Poetry: An Introduction. (Cross-listed.) *Staff*  
220. Rabbinic Hebrew. *E. Meyers or staff*  
244. Archaeology of Palestine in Hellenistic-Roman Times. *E. Meyers*

### Yiddish

- 1, 2. Elementary Yiddish. *Staff*

### SPECIAL TOPICS COURSES

### History

- 195S. The Palestine Problem. *Kuniholm*

Opportunities for independent study are also offered in various related departments. Procedures for registration and applications are available in 118 Gray Building.

For further information, please contact the director of the Center for Judaic Studies and director of the certificate program in Judaic Studies, Box 90964, Durham, NC 27708-0964.

## Korean

For courses in Korean, see Asian and African Languages and Literature.

## Latin

For courses in Latin, see Classical Studies.

## Latin American Studies (LST)

Associate Professor James, *Chair, Council on Latin American Studies*

A certificate, but not a major, is available in this program.

The program in Latin American Studies, which is administered by the Council on Latin American Studies, provides students with the opportunity for an interdisciplinary and in-depth study of the realities of Latin American societies and cultures. Courses in this area are sponsored by the program, offered through several academic departments and programs, and taught by many faculty members. In addition to offering courses and a certificate on completion of the requirements, the Council on Latin American Studies also sponsors lectures, conferences, and film festivals. Moreover, the council and the Institute of Latin American Studies at Chapel Hill sponsor the Duke-UNC Program in Latin American Studies, which provides opportunities for collaboration with faculty and students from the University of North Carolina who are interested in Latin America. The Duke-UNC Program sponsors yearly faculty exchanges between the two institutions, joint undergraduate seminars, and other special initiatives.

Students interested in earning a certificate in Latin American studies are encouraged to declare it by completion of their fifth semester. Students may also elect this interest in Latin America while participating in a Duke-approved study abroad program either during a summer or during their junior year. Duke offers its own program in Bolivia during the academic year, based at the Universidad Mayor de San Andrés and the Universidad Católica Boliviana.

For further information consult the chair of the Council on Latin American Studies or the program coordinator at 2114 Campus Drive.

### CERTIFICATE IN LATIN AMERICAN STUDIES

The course of study for program participants is intended to be interdisciplinary. Students working toward a certificate in Latin American Studies will declare a major in an academic department. To qualify for the certificate, students take the interdisciplinary capstone course (Latin American Studies 198), fulfill the indicated language requirement, and take four additional area courses, three of which must be at or above the 100 level. Also, at



least three different departments must be represented overall, with no more than three courses counting from one single department or major. The language requirement can be fulfilled in one of three ways: 1) by taking three language courses below the 100 level in any one of the most commonly taught languages spoken in Latin America: Spanish, Portuguese, French; 2) by taking one course taught in any one of these languages at the 100 level or above; or 3) by taking two courses in any one of the less commonly taught Latin American languages (such as Aymara, Quechua, Yucatec Maya). Aymara and Quechua language courses are offered as part of the Duke-in-the-Andes Program in Bolivia. A Summer Intensive Yucatec Maya Language Program is also offered through the Duke-UNC Program in Latin American Studies, on the UNC campus.

Appropriate courses may come from the list given below, or may include other courses not listed below (new courses, special topics courses, and independent study) with at least 50% of course content on a Latin American topic and with term papers or other major projects focusing on a Latin American subject. To determine if specific courses meet requirements for the certificate, students should consult the program coordinator. Regular courses are described under the listing of the various departments. Students may also wish to take advantage of house courses offered on Latin American topics although house courses cannot satisfy the requirements of the certificate.

Eligible undergraduates satisfying the certificate may use no more than two courses that are also used to satisfy the requirements of any major, minor, or other certificate program. Comparative Area Studies majors and minors interested in choosing Latin America as their primary area of concentration within that major or minor should consult the director of comparative area studies.

## **LATIN AMERICAN STUDIES PROGRAM COURSES (LST)**

**198. Special Topics in Latin American Studies. (AL, CZ)** A problem-oriented course integrating approaches from two disciplines; team-taught. Topics and disciplines vary from year to year. For juniors and seniors. C-L: Comparative Area Studies and Spanish 124. One course. *Staff*

**200S. Seminar in Latin American Studies.** Interdisciplinary study of geographical, historical, economic, governmental, political, and cultural aspects of modern Latin America and the current issues facing the region. Specific topics will vary from year to year. For seniors and graduate students. One course. *Staff*

## **LATIN AMERICAN AREA COURSES**

### **Regularly Scheduled Courses**

#### **African and African-American Studies**

70, 71. The Third World and the West. (Cross-listed.) *Staff*

127A. The Caribbean, 1492-1700. (Cross-listed.) *Gaspar*

127B. The Caribbean in the Eighteenth Century. (Cross-listed.) *Gaspar*

138. Francophone Literature. (Cross-listed.) *Jonassaint or staff*

170. Afro-Brazilian Culture and History. (Cross-listed.) *French*

233S. Slave Resistance and Social Control in New World Societies. (Cross-listed.) *Gaspar*

#### **Art History**

195. Pre-Columbian Art and Culture of Andean South America. (Cross-listed.) *Staff*

#### **Asian and African Languages and Literature**

168. Francophone Literature. (Cross-listed.) *Jonassaint or staff*

#### **Cultural Anthropology**

64S. Globalization and Latin America. *Starn*

129. Introduction to North America. (Cross-listed.) *Thompson*

- 199A, S. The Articulation of Culture in the Bolivian Andes. (Cross-listed.) *Staff*  
 199B. Bolivian Cultural Anthropology. *Staff*  
 199C. Bolivian Culture. *Staff*  
 199E, S. Colonialism, Ethnicity, and Gender in Postrevolutionary Bolivia. (Cross-listed.) *Staff*

### **Economics**

115. Introduction to North America. (Cross-listed.) *Thompson*  
 175. Economics of Modern Latin America. (Cross-listed.) *Staff*

### **French**

168. Francophone Literature. (Cross-listed.) *Jonassaint or staff*

### **History**

- 75, 76. The Third World and the West. (Cross-listed.) *Staff*  
 108F. Introduction to North America. (Cross-listed.) *Thompson*  
 127A. The Caribbean, 1492-1700. (Cross-listed.) *Gaspar*  
 127B. The Caribbean in the Eighteenth Century. (Cross-listed.) *Gaspar*  
 131B. The Spanish Caribbean. (Cross-listed.) *TePaske*  
 136A. Introduction to Contemporary Latin American Reality. (Cross-listed.) *James*  
 136B. Biography and Politics in Latin America. (Cross-listed.) *French*  
 136C. Nineteenth-Century Latin America: Building Postcolonial Nations. (Cross-listed.) *Staff*  
 170C. Afro-Brazilian Culture and History. (Cross-listed.) *French*  
 174B. Modern Latin America. (Cross-listed.) *Staff*

### **Literature**

141. International Popular Culture. (Cross-listed.) *Willis*

### **North American Studies**

110. Introduction to North America. (Cross-listed.) *Thompson*

### **Political Science**

119. Introduction to North America (B). (Cross-listed.) *Thompson*  
 151. Introduction to Latin American Politics (B). (Cross-listed.) *Morgenstern*  
 151A. Introduction to Latin American Politics (B). (Cross-listed.) *Staff*  
 151D. Introduction to Latin American Politics (B). (Cross-listed.) *Morgenstern*

### **Portuguese**

- 111S. Research Seminar in Contemporary Lusophone Issues. (Cross-listed.) *Damasceno*

### **Public Policy Studies**

115. Introduction to North America. (Cross-listed.) *Thompson*

### **Romance Studies**

125. Introduction to North America. (Cross-listed.) *Thompson*

### **Sociology**

109. Introduction to North America. (Cross-listed.) *Thompson*  
 126. Third World Development. (Cross-listed.) *Gereffi*  
 188B, S. Colonialism, Ethnicity, and Gender in Postrevolutionary Bolivia. (Cross-listed.) *Staff*

### **Spanish**

- 115, 116. Introduction to Spanish-American Literature. (Cross-listed.) *Staff*  
 117S. Spanish-American Short Fiction. *Pérez-Firmat or staff*  
 121. Latin-American Literature in Translation. (Cross-listed.) *Dorfman*  
 124. Special Topics in Latin American Studies. (Cross-listed.) *Staff*  
 132A, S. The Articulation of Culture in the Bolivian Andes. (Cross-listed.) *Staff*

- 132B. S. Colonialism, Ethnicity, and Gender in Postrevolutionary Bolivia. (Cross-listed.) *Staff*  
 140A. S. Bolivian Contemporary Short Fiction. *Staff*  
 140B. S. Bolivian Literature Since the Reemergence of Democracy (1982-1995). *Staff*  
 140C. S. Cultural Diversity in the Andes. (Cross-listed.) *Staff*  
 140E. Film and Political Culture in Contemporary Bolivia. *Staff*  
 143S. Literature of the Discovery and Conquest of America. (Cross-listed.) *Staff*  
 144S. Spanish-American Literature of Identity. (Cross-listed.) *Pérez-Firmat*  
 145S. Literature of the Hispanic Minorities of the United States. (Cross-listed.) *Pérez-Firmat*  
 146. The Spanish-American Novel. (Cross-listed.) *Moreiras or staff*  
 147S. Latin-American Women Writers. (Cross-listed.) *Staff*  
 148. Colonial and Postcolonial Studies in Latin America and the Caribbean. (Cross-listed.) *Mignolo*  
 175S. Hispanic Literature and Popular Culture. (Cross-listed.) *Sieburth*

### **Special Topics Courses, Offered Periodically**

#### **Cultural Anthropology**

- 280S. Culture, Power and History. *Starn*  
 280S. Ethnohistorical Methods: Colonial Encounters. *Silverblatt*

#### **History**

- 104B. A Survey of Latin American History through Film. *TePaske*  
 195S. Seminar in Latin American History. *Staff*

#### **Literature**

31. Special Topics in Hispanic Cinema. *Staff*  
 151/152. Caribbean Poetry. *Davis*

#### **North American Studies**

283. Seminar in North American Studies. *Staff*

#### **Political Science**

- 299B. Political Economy of Development in Latin America and Asia. *Staff*

#### **Portuguese**

- 200S. Seminar in Portuguese Literature. *Damasceno*  
 202S. Topics in Portuguese and Brazilian Literature and Culture. *Damasceno*

#### **Romance Studies**

124. Modernity, Ethnicity, and Colonization. *Mignolo*

#### **Sociology**

- 110D. Comparative Sociology: Latin America. *Gereffi*

#### **Spanish**

- 122S. Topics in Latin American Literatures and Cultures. *Staff*  
 124. Special Topics in Latin American Studies. *Staff*  
 131. Topics of Hispanic Civilization. *Staff*  
 244. Topics in Twentieth-Century Latin American Fiction. *Moreiras*  
 248. Studies in Spanish-American Literature. *Staff*

## **Linguistics (LIN)**

Professor Andrews, *Chair*; Associate Professor Tetel, *Director of Undergraduate Studies*; Professors Apte (cultural anthropology), Butters (English), Holloway (English), O'Barr (cultural anthropology), Thomas (romance studies); Associate Professors Day (psychology), Mazuka (psychology), Posey (philosophy), Quinn (cultural anthropology), Rasmussen

(German); Assistant Professor Walther (German); Adjunct Assistant Professor Keul (German). *Affiliated faculty:* Professors Biermann (computer science), Borchardt (German), Cooke (Asian and African languages and literature), Fish (English), Flanagan (philosophy), Garci-Gómez (romance studies), Hasher (psychology), Rubin (psychology), Hermstein Smith (English and literature); Professor of the Practice Gopen (English)

A major is available in this program.

From the earliest philosophers to modern neuroscientists, researchers from a wide range of disciplines have explored a diverse range of issues concerning the human capacity for language and the diversity of the world's languages. Linguists work at the intersection of these issues and define linguistics as the science of language and languages. During the last 150 years, linguists have developed a variety of theoretical paradigms to describe and explain language history, dialect variation, cross-cultural similarities and differences, the neurological processing and production of language, and the evolutionary emergence of language.

The linguistics major at Duke is unusual in its range of theoretical approaches coupled to the study of languages of the world. The required courses for the major stress empirical methods and the global data base; the theory courses expose the student to the perspectives offered by historical and comparative linguistics, structural linguistics, generative linguistics, sociolinguistics, semiotics, discourse analysis, philosophy, cognitive linguistics and psycholinguistics. The major maintains the traditional and mainstream body of linguistic inquiry and, at the same time, encourages exploration of the most recent developments in language study that issue from cultural and literary theory and the biological sciences.

## LINGUISTICS PROGRAM COURSES

**101. Introduction to Linguistics. (SS)** Introduction to the scientific study of linguistics and languages. Topics include the origin and nature of language, methods of historical and comparative linguistics, theories and schools of linguistics, empirical and descriptive approaches to the study of language, including phonology, morphology, semantics, and syntax. C-L: Comparative Area Studies, Cultural Anthropology 107, and English 111. One course. *Butters or Tetel*

**102. Languages of the World. (SS)** The major languages of the world viewed in the context of the communicative and signficante functions of language as parameters that shape and define society. The role of language in defining and structuring culturally-based relationships from a semiotic point of view. The structure, writing systems, phonology, morphology, and lexicon of languages from the following groups: Indo-European, Semitic, Turkic, Finno-Ugric, Caucasian, Afroasiatic, Sino-Tibetan, Niger-Kordofanian, Dravidian, and Native American languages. C-L: Comparative Area Studies, Cultural Anthropology 114, and English 114. One course. *Andrews or Tetel*

**110. Psychology of Language. (SS)** See C-L: Psychology 134. One course. *Day*

**199. Special Topics. (SS)** Topics to be announced. One course. *Staff*

**200. Issues in Second Language Acquisitions. (FL, SS)** Analysis of principles of second language acquisition in the context of theoretical and applied language paradigms. Psychological, anthropological, and sociological theories included where relevant. One course. *Andrews*

**215S. Senior Seminar in Linguistics. (SS)** Theory and methods of comparative linguistics. Diachronic and synchronic approaches to the study of comparative linguistics in phonology, morphology, morphophonemics, syntax, and lexical categories in the context of the world's language. Both I-E and non I-E included. Topics include theories of reconstruction,



languages in contact, abductive processes, and questions of linguistic typology. One course. *Andrews, Butters, or Tetel*

299. Special Topics. (SS) Topics to be announced. One course. *Staff*

## LINGUISTICS COURSES LISTED BY DEPARTMENT

### Regularly Scheduled Courses

#### Balto-Finnic

200. Balto-Finnic Linguistics. *Staff*

#### Cultural Anthropology

107. Introduction to Linguistics. (Cross-listed.) *Butters or Tetel*

110. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*

112. Current Topics in Linguistics. (Cross-listed.) *Staff*

114. Languages of the World. (Cross-listed.) *Andrews or Tetel*

119. Language, Culture, and Society. (Cross-listed.) *Apte, O'Barr, or Strauss*

174. Gender and Language. (Cross-listed.) *Andrews*

250S. Culture and Discourse. *Apte, Ewing, O'Barr, Quinn, or Strauss*

#### Computer Science

274S. Computational Linguistics Seminar. *Biermann*

#### English

111. Introduction to Linguistics. (Cross-listed.) *Butters or Tetel*

112. English Historical Linguistics. *Butters or Tetel*

114. Languages of the World. (Cross-listed.) *Andrews or Tetel*

115. Gender and Language. (Cross-listed.) *Andrews*

119. Current Topics in Linguistics. (Cross-listed.) *Staff*

120. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*

205. Semiotics and Linguistics. (Cross-listed.) *Andrews*

208. History of the English Language. (Cross-listed.) *Butters or Tetel*

#### French

108. Advanced Translation and Stylistics. *Thomas or staff*

210. The Structure of French. *Thomas*

211. History of the French Language. (Cross-listed.) *Thomas*

#### German

\*\*260. History of the German Language. (Cross-listed.) *Rasmussen*

\*\*261. Second Language Acquisition Theory and Practice. *Walther*

#### Philosophy

103. Symbolic Logic. *Brandon, Güzeldere, or Posy*

109. Philosophy of Language. *Posy*

\*112. Philosophy of Mind. *Flanagan, Güzeldere, or Sanford*

228S. Recent and Contemporary Philosophy. *Posy*

#### Psychology

92. Cognitive Psychology: Introduction and Survey (C). *Day, Hasher, Rubin, or Serra*

\*125. Memory and the Brain (B). *Swartzwelder*

134. Psychology of Language (C). (Cross-listed.) *Day*

143S. Mind, Brain, and Computers (B, C). *Schmajuk*

\*\*153S. Issues in Language Development (C, D). *Mazuka*

\*210S. Cognition (C). *Day*

\*220S. Psycholinguistics (C). *Day or Mazuka*

## **Religion**

229S. Old Church Slavonic. (Cross-listed.) *Staff*

## **Russian**

174. Gender and Language. (Cross-listed.) *Andrews*

185S. Introduction to Slavic Linguistics. (Cross-listed.) *Andrews*

186S. History of the Russian Language. (Cross-listed.) *Andrews*

201S. Topics in Comparative Slavic Linguistics. (Cross-listed.) *Andrews*

203S. Old Church Slavonic. (Cross-listed.) *Staff*

205. Semiotics and Linguistics. (Cross-listed.) *Andrews*

207S. Semantics. *Andrews*

## **Sociology**

160. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*

## **Spanish**

109S. Structure of Spanish. *Caballero*

210. History of the Spanish Language. (Cross-listed.) *Garci-Gómez*

## **Special Topics Courses, offered periodically:**

### **Cultural Anthropology**

112. Current Topics in Linguistics. Linguistics Law (Cross-listed.) *Staff*

### **English**

\*48A. Focus Program on Writing or Language: Language, Mind, and Human Behavior. *Tetel*

119. Current Topics in Linguistics. Linguistics and Pragmatics or Language and Law (Cross-listed.) *Staff*

### **Romance Studies**

\*210S. Topics in Linguistics. *Staff*

## **Slavic Languages and Literatures**

### **Russian**

119S. Topics in Slavic and Northern European Languages. *Andrews*

## **THE MAJOR**

The major is composed of ten courses, eight of which must be at the 100 level or above. The courses are devised to provide depth and breadth in linguistic theory, the different schools of linguistics, the history and development of linguistic thought, and the interdisciplinary aspects of linguistics in the context of languages and cultures. Majors must take Linguistics 101 and 102, which define the fundamental questions of linguistic theory in the context of the world's languages; and in the senior year the capstone course Linguistics 215S, which adds cohesion to the major. For depth, the student is required to take three courses from the list of theory courses, which provide the necessary theoretical and empirical constructs for the study of linguistics. In addition, two courses are required in one of the concentrations in a specific area of linguistics. All majors are required to take at least two foreign language courses at or above the 100 level.

## **MAJOR REQUIREMENTS**

### **Introductory Courses (2):**

Introduction to Linguistics (Cross-listed.)

Languages of the World (Cross-listed.)

**Theory: Three (3) courses in the study of theoretical linguistics. Courses to be chosen from the following list:**

**Regularly Scheduled Courses:**

**Computer Science**

274S. Computational Linguistics Seminar

**Cultural Anthropology**

119. Language, Culture, and Society

250S. Culture and Discourse

**English**

112. English Historical Linguistics

205. Semiotics and Linguistics (Cross-listed.)

**Philosophy**

103. Symbolic Logic

109. Philosophy of Language

**Psychology**

134. Psychology of Language

\*220S. Psycholinguistics

**Slavic Languages and Literatures**

**Russian**

174. Gender and Language (Cross-listed.)

205. Semiotics and Linguistics

207. Semantics

**Special Topics Courses, offered periodically:**

**Cultural Anthropology**

112. Current Topics in Linguistics (Cross-listed.)

**English**

119. Current Topics in Linguistics (Cross-listed.)

**Disciplinary Concentration.** Two (2) courses in one of the areas listed below. No course taken for credit as Theory may be counted to fulfill the disciplinary concentration requirement. Qualifying courses are listed below following the complete description of major requirements.

\*Cognitive Science

Cultural Anthropology

English

Germanic

\*\*Language Acquisition

Philosophy

Psychology

Romance Studies

Slavic Languages

\* Coursework in cognitive science is given under individual departments and is marked by \*.

\*\* Coursework in language acquisition is given under individual departments and is marked by \*\*.

**Senior Seminar in Linguistics.** (Linguistics 215S). The capstone course for the major, usually taken in the senior year.

**Language Requirement.** Two (2) semester courses in a single language at or above the 100 level, excluding languages in which the student possesses native proficiency in speech and writing. Students with advanced placement credits or other evidence of foreign language proficiency are not exempted from this requirement. Advisor's approval is required in order

to determine the language chosen for the major. The specific language courses are too numerous to list here. Advisors should also be consulted for specific approval of the language choice if it does not conform to the list below or in the case of a trilingual student: Arabic, Chinese, French, German, Greek, Hebrew, Hindi, Italian, Japanese, Korean, Latin, Polish, Portuguese, Russian, Spanish, Swahili.

### **Graduation with Distinction**

The Linguistics Program offers work leading to graduation with distinction. See the section on honors in this bulletin and the program chair.

## **Literature Program (LIT)**

Professor Jameson, *Chair*; Professor Kaplan, *Director of Undergraduate Studies*; Professors Fish, Lentricchia, Mignolo, Moi, Radway, Rolleston, B. H. Smith, Stewart, Surin, Thomas, and Tompkins; Associate Professors Gaines, Lahusen, Lubiano, Moreiras, and Willis; Assistant Professors Fischer and Hardt; Research Professors Dorfman and Mudimbe; Visiting Assistant Professor Benamou. *Affiliated faculty*: Professors Burian (classical studies), Clum (English), Cooke (Asian and African languages and literature), Davidson (English), Davis (classical studies), Orr (romance studies), Torgovnick (English), and Wharton (art history); Associate Professors Morton (Germanic languages and literature), Moses (English), Powell (art history), Stiles (art history), and Wang (Asian and African languages and literature); Assistant Professors Gheith (Slavic languages and literatures) and Risholm (Germanic languages and literature); Associate Professor of the Practice Khanna (Asian and African languages and literature)

A major is available in this program.

### **INTRODUCTORY**

**20S. Introduction to Literature. (AL)** Introduction to the study of literature and other forms of cultural expression, such as film. Different introductory approaches will be used in each section (for example, a systematic account of literary genres, a historical survey of ideas and forms of fiction, concepts of authorship and subjectivity, or of literary meaning and interpretation). More than one national literature or culture represented. One course. *Staff*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**50S. Special Topics in the FOCUS Program. (AL)** Designed especially for first-year students interested in world literature, culture, and critical theory. Topics vary each semester offered. One course. *Staff*

### **FUNDAMENTALS**

**90. Perspectives on Literary and Cultural Study. (AL)** An introduction to four areas of investigation vital to the Literature Program: film and video, cultural studies, literary studies, and theory. May be team-taught by several members of the program with expertise in one of these areas. Focus on a centralizing theme, for example: the family, the trial, or celebrity. Required for majors; open to nonmajors. One course. *Staff*

**95. Special Topics in Language. (SS)** Topics will vary and may include history of linguistics, classical and twentieth-century rhetoric or poetics, semiotics, the philosophy of language, structuralist and poststructuralist linguistics, postmodern language theory, and/or developments in fields such as cognitive science, artificial intelligence, and animal communication. Contributions of major figures, such as Saussure, Wittgenstein, Bakhtin, J. L. Austin, Foucault, and Derrida. One course. *Staff*



**96. Contemporary Literary and Cultural Theory: An Introduction.** (AL) The major concepts and principles of contemporary literary theory. "Poststructural" approaches to language and textuality, the invention of "postmodernism," and theories of history and literature. Vocabulary and tools necessary for reading and understanding contemporary critical and theoretical texts. One course. *Staff*

**98. Introduction to the Study of Literature and Society.** (AL) Literature in relation to history, social situation, and culture. Development of modes of interpretation that juxtapose textual features and broader contextual concern. Readings from Western and non-Western sources representative of a number of periods and genres. C-L: Comparative Area Studies and Perspectives on Marxism and Society. One course. *Lentricchia or Willis*

**99. Great Books in the Western Tradition.** (AL) A group of texts central to Western cultural identity from antiquity to the modern age, examined from a variety of critical and theoretical perspectives. Texts and topics vary according to the specializations of participating faculty, but in every case attention is given to such fundamental issues as the representation of "human nature;" the relations of individual and society, human and divine, male and female; the transmission and interrogation of ideas and values in literature; and the function of narrative itself in Western culture. One course. *Burian, Janan, or Morton*

## FILM/TV STUDIES

**100. Introduction to Cultural Studies.** (AL) See C-L: English 101B; also C-L: Film and Video, and Perspectives on Marxism and Society. One course. *Gaines, Radway, Surin, Tompkins, Torgovnick, or Willis*

**110. Introduction to Film.** (AL) Not open to students who have taken Drama 132. See C-L: English 101A; also C-L: Drama 173, and Film and Video 130. One course. *Gaines, Radway, Surin, Tompkins, Torgovnick, or Willis*

**111S. Special Topics in Advanced Film, Video, or Audio Production.** (AL) Also offered as Film and Video 101S. Prerequisite: Drama 173, English 101A, or Literature 110. One course. *Staff*

**112. Special Topics in National Cinema.** (AL) Understanding nationhood through film culture. Industrial base, reception history, and critical context for development of national cinemas. Exemplary films from a range of periods. C-L: Film and Video. One course. *Staff*

**113. Studies in Comparative World Cinema.** (AL) History and theory of film and video technology across nations; postcolonial patterns and their electronic and mechanical transmission; economics of distribution, reception, exhibition, and their relation to aesthetics. The first world defined against the second and third by means of cultural product. C-L: English 122, Film and Video, German 113, and Russian 113. One course. *Staff*

**114. Film Theory.** (AL) Recent critical developments in Marxist aesthetics, structuralism, semiotics of the image, feminist film theory. Both experimental and Hollywood narrative films. C-L: Film and Video and Women's Studies. One course. *Gaines*

**115. Sexualities in Film and Video.** (AL) The variety of ways sexualities are represented in current mainstream and avant-garde film and video art. Topics include voyeuristic, narcissistic, and other perverse pleasures; modes of representing bodies, genders, and desires (especially gay and lesbian ones) in relation to national and subcultural identities. Readings in film theory as well as related literary and critical texts. C-L: English 124 and Film and Video. One course. *Clum, Gaines, or Moon*

**116. Studies in Film History.** (AL) See C-L: English 185; also C-L: Drama 174, and Film and Video. One course. *Clum, Gaines, or Jameson*

**117. Documentary Film History.** (AL, CZ) See C-L: History 150A; also C-L: Film and Video, Perspectives on Marxism and Society, and Political Science 198. One course. *Gaines, Paletz, or Wood*

**118. Experimental Film and Video.** (AL) Historical overview of European and American movements from surrealism and Dada to the present; parallels between cinema and significant schools in the other arts. Special attention to the relationship between form and technological changes in the camera; the conditions of reception, from public film exhibition to home video intimacy. C-L: Film and Video. One course. *Staff*

**119. Television, Technology, and Culture.** (AL) Prerequisite: Drama 173, English 101A, or Literature 114. See C-L: English 190; also C-L: Film and Video. One course. *Gaines*

**120. Special Topics in Television Genres.** (AL) Close study of one or more mainstream television genres, such as the sit com, soap opera serial, cop show, game show, network news show, or the "made for TV" movie. C-L: Film and Video. One course. *Staff*

## GENDER STUDIES

**121. Special Topics in Women in Literature.** (AL) Literary and/or theoretical approaches to questions concerning the representation of women and/or femininity in literature. C-L: Women's Studies. One course. *Staff*

**123. Special Topics in Women Writers.** (AL) Issues of gender and representation in works by women from the Middle Ages to the modern period. Concentration on specific periods, areas, or themes. Relationship of women's literature to the other arts, political practices, and social developments. C-L: Women's Studies. One course. *Staff*

**125. Special Topics in Gender and Sexuality.** (AL) Different literary and/or theoretical approaches to questions of sex, gender, and sexuality. C-L: Women's Studies. One course. *Staff*

## STUDIES IN CULTURE

**131. Special Topics in Culture and the Arts.** (AL) Literature in relation to the plastic and visual arts, architecture, and photography. Topics will vary according to the instructor, for example: modernism and postmodernism, the avant-garde, identity, and nationalism in the art of a given period. One course. *Staff*

**132. Special Topics in the Study of Literature in Relation to Other Disciplines.** (AL) A comparative approach to the study of literature that draws on the methods and materials of other disciplines, such as sociology, history, anthropology, or philosophy. Focus on the methods of interdisciplinary study. Contents vary with instructors. One course. *Staff*

**140. History of Mass Culture in the United States.** (AL) See C-L: English 156; also C-L: Film and Video. One course. *Gaines, Radway, Tompkins, Torgovnick, or Willis*

**141. International Popular Culture.** (AL) Basic concepts in critical theory; folk vs. mass culture, appropriation, resistance, hegemony, as studied through Japanese, Chinese, Australian, British, East Indian, and Latin American popular forms. American imperialism and the exportation of mass forms juxtaposed with international reception of popular fiction, characters, music, and television programs. C-L: Comparative Area Studies, Film and Video, and Latin American Studies. One course. *C. Davidson, Gaines, Radway, or Willis*

**143. Problems in Global Culture. (AL)** The study of cultural production from across the world, with a special emphasis on mass media, fiction, and literature. A basically comparatist, multigenre approach. One course. *Dorfman*

**144S. Special Topics in Literature and Revolution. (AL)** The relation of literature to revolutionary movements and situations, such as the October Revolution in Russia, the May Fourth period in China, or the May 1968 uprisings in France. Focus also on the role of intellectuals and artists in political and social struggles. Contents vary with instructors. One course. *Staff*

**145. Special Topics in Science and Culture. (AL)** Approaches to the question of science and technology in a cultural context. Readings by scientists and scholars of science and society. One course. *Staff*

## LITERARY STUDIES

**150. Special Topics in Literary Movements. (AL)** Historical, theoretical, and/or formal approaches to literary movements in different periods and cultures. One course. *Staff*

**151. Special Topics in Literary Genres. (AL)** Studies in one or more literary genres or subgenres, such as the novel, drama, poetry, or the documentary novel, epic poetry, love lyrics, modernist drama, and so on. Focus on questions of genre and form, but other themes discussed may vary widely. One course. *Staff*

**154. Special Topics in Individual Authors. (AL)** Biographic, historical, and/or stylistic approaches to one or two individual authors, as well as critical debates concerning their work. One course. *Staff*

## AREA STUDIES

**161. Special Topics in Third World or Postcolonial Literature and Cultures. (AL)** Colonial and postcolonial literatures of India, New Zealand and Australia, Canada, Francophone and Anglophone Africa, the Caribbean, North and South America. Organized according to trends, topics, and genres. C-L: Comparative Area Studies. One course. *A. Davidson, Ferraro, Moses, or Willis*

**162. Special Topics in Literature and National Cultures, Ethnicity, Race. (AL)** Literature as a part of specific national cultures; questions such as: How does literature articulate conceptions of nationality, ethnicity, and race? Does literature have a color? What is the relationship between national languages, dialects, and ethnic languages? What role does literature as an institution play in the constructions of nationhood? C-L: Comparative Area Studies and Perspectives on Marxism and Society. One course. *Staff*

**163. The Canadian Image: Cultural Production in French and English Canada. (AL)** What image do Canadians generate of themselves and the world and why? Popular and experimental work in English and French Canadian arts—primarily film and literature, but some painting and music—studied for their meaning in the making or unmaking of a social and political identity and a national image, from the 1960s to the present. C-L: Canadian Studies, Comparative Area Studies, and Film and Video. One course. *A. Davidson*

## ADVANCED UNDERGRADUATE STUDIES

**181. Marxism and Society. (SS)** See C-L: Cultural Anthropology 139; also C-L: Comparative Area Studies, Education 139, History 186, Perspectives on Marxism and Society, and Sociology 139. One course. *Staff*

**182. Special Topics in Theory.** (AL) An advanced investigation of major concepts and principles in literary and/or cultural theory. Contents and methods vary with instructors. One course. *Staff*

**190S. Senior Seminar.** (AL) Topics vary each semester offered. One course. *Staff*

### STUDY AWAY FROM DUKE

**195. Special Topics in World Media.** (AL) Studies in the media and society in a national or international setting; offered only in a Duke study abroad program. One course. *Staff*

**196. Special Topics in World Literature and Culture.** (AL) Studies in literature and culture in a national or comparatist mode; offered only in a Duke study abroad program. One course. *Staff*

**197S. Special Topics in the United States Culture Industries.** (AL) Critical and historical readings in the culture of art and entertainment in the United States, consideration of the popular and the elite. Overview of high art institutions—museums and theaters—as well as the music, television, and film industries. Consideration of audiences, aesthetics, taste cultures. Readings in entertainment law, corporate history, and regional culture. Open only to students in the Duke in Los Angeles Program. C-L: Film and Video. One course. *Staff*

### INDEPENDENT STUDY AND SENIOR/GRADUATE COURSES

**199. Independent Study.** Consent of instructor required. One course. *Staff*

**200S. Seminar in Asian and African Cultural Studies.** (CZ) See C-L: Asian and African Languages and Literature 200S; also C-L: African and African-American Studies 200S, and Cultural Anthropology 288S. One course. *Staff*

**212. Studies in Narrative.** (AL) Topics to vary. One course. *Staff*

**214. Gender, Nationalities, and Russian Literary Traditions.** (AL, CZ) See C-L: Russian 214; also C-L: Women's Studies. One course. *Gheith*

**251. History of Criticism.** (AL, CZ) A historical survey of critical and philosophical concepts affecting the definition and evaluation of literature from Plato through the nineteenth century. One course. *Hardt, Jameson, Lentricchia, Moreiras, or Stewart*

**252. Criticism and Literary Theory in the Twentieth Century.** (AL) Introduction to critical movements, philosophies, and strategies forming contemporary theories of literature: deconstruction, feminism, formalism, Marxism, New Criticism, phenomenology, psychoanalysis, structuralism. May be repeated for credit according to change of content or instructor. One course. *Jameson or Rolleston, with guest lecturers*

**279. The Bestseller: Cultural Populism in the 1990s' China.** (AL) See C-L: Asian and African Languages and Literature 259; also C-L: Cultural Anthropology 263. One course. *Wang*

**280. Semiotics for Literature.** (AL) See C-L: French 223. One course. *Thomas*

**281. Paradigms of Modern Thought.** (AL, CZ) Specialized study of the work of individual thinkers who have modified our conceptions of human reality and social and cultural history, with special emphasis on the form and linguistic structures of their texts considered as "language experiments." Topics will vary from year to year, including: Marx and Freud; J.-P. Sartre; Walter Benjamin; etc. One course. *Jameson, Moi, Mudimbe, or Surin*

**284. The Intellectual as Writer.** (AL, CZ) History and theory of the literary role of the intellectual in society (e.g., in Augustan Rome, the late middle ages, the Renaissance, America, Latin America). One course. *Jameson, Lentricchia, Moi, Mudimbe, or Surin*



**285. Literature and Ideology.** (AL, CZ) The theoretical problem of the relationship between literature and ideology, explored through the cultural history of genres, major writers, or aesthetic movements. One course. *Jameson, Lentricchia, or Mudimbe*

**286. Topics in Legal Theory.** A consideration of those points at which literary and legal theory intersect (e.g., matters of intention, the sources of authority, the emergence of professional obligation). One course. *Fish*

**289. Topics in Feminist Theory.** One course. *Moi, Radway, or Tompkins*

**291. Topics in Popular Culture and the Media.** (AL) One course. *Radway, Tompkins, or Willis*

**292. Topics in Non-Western Literature and Culture.** (AL, CZ) One course. *Mudimbe*

**293. Special Topics in Literature and History.** (AL, CZ) Relationship of literary texts to varieties of historical experience such as wars, periods of revolutionary upheaval, periods of intense economic growth, "times of troubles," or stagnation. Literary texts and historical content posed in such formal ways as the theoretical problem of the relationship between literary expression and form and a range of historical forces and phenomena. One course. *Jameson, Kaplan, or Orr*

**294. Theories of the Image.** (AL) Different methodological approaches to theories of the image (film, photography, painting, etc.), readings on a current issue or concept within the field of the image. Examples of approaches and topics are feminism, psychoanalysis, postmodernism, technology, spectatorship, national identity, authorship, genre, economics, and the ontology of sound. One course. *C. Davidson, Gaines, or Jameson*

**295. Representation in a Global Perspective.** (AL) Problems of representation approached in ways that cross and question the conventional boundaries between First and Third World. Interdisciplinary format, open to exploration of historical, philosophical, archeological, and anthropological texts as well as literary and visual forms of representation. One course. *Dorfman, Jameson, or Mignolo*

**297. Topics in Cultural Studies.** (AL) One course. *Gaines, Radway, Surin, and staff*

**298. Topics in Philosophy and Literature.** (AL, CZ) Exploration of problems common to literary theory and philosophy. Examples of topics include: problems of identity, consciousness, foundationalism, interpretation, or ethics, or schools of thought such as pragmatism, phenomenology, and existentialism. One course. *Flanagan, Jameson, Mudimbe, and Surin*

**299. Universalism in Twentieth-Century Thought.** (AL, CZ) The Enlightenment tradition and its critical reception in the twentieth century. Readings range from classic Enlightenment texts to contemporary texts. One course. *Staff*

## **COURSES CURRENTLY UNSCHEDULED**

**122. Feminism in Twentieth-Century Art.** (AL)

**211. Theory and Practice of Literary Translation.** (AL)

**254. Introduction to Feminism.** (AL)

## **THE MAJOR**

All students must be able to demonstrate reading knowledge of at least one foreign language either through advanced placement or completion of the appropriate coursework. In addition, literature students will be asked to fulfill the requirements in one of two tracks. When students declare the literature major, they will be asked to inform the director of undergraduate studies of the track selected and to work out a tentative course of study.

### **(1) Literature and Cultural Theory**

This track enables students to emphasize a theoretical and comparative perspective in the study of literature. Students should develop a coherent rationale for the kind of comparisons they are undertaking (for example, of specific national literatures, within a particular historical period), and take an appropriate number of more theoretical courses as well. Students must take a total of ten courses, eight of which must be at the 100 level or above, distributed in the following manner:

Literature 90; one (1) introductory course appropriate to the student's particular interests (from among courses numbered 90 through 100, inclusive); five (5) courses at the level of 100 or above in the Undergraduate Program in Literature, to be approved by the advisor; two (2) courses in literature taught in a foreign language, also to be approved by the advisor (the topics, periods, and foci of these courses to intersect in some way with the courses elected from within the Literature Program); Literature 190S (Senior Seminar)

### **(2) Literature and Film/TV Studies**

This course has been designed to meet the needs of the many students who wish to elect a literature major, but who want to concentrate more specifically upon Film/TV studies. Literature majors electing this track may also pursue the Film and Video Certificate, but they may count only two courses taken to satisfy the requirements of the Literature and Film/TV Studies track toward the certificate. (See Film and Video Certificate entry in this bulletin.)

Students seeking to satisfy the requirements of this track must take a total of ten courses, eight of which must be at the 100 level or above, distributed in the following manner:

Literature 90, 100, 110, 190S (Senior Seminar); three (3) courses in the Undergraduate Program in Literature approved by the advisor; two (2) courses from among those listed in the Film and Video Program Core Courses or one (1) 100-level Film/TV Studies course and one (1) 100-level FV (Film and Video) production course; one (1) literature course in a foreign language at the 100 level or above.

## **Graduation with Distinction**

Students wishing to graduate with distinction in Literature will take the Senior Seminar, Literature 190, in both the fall and spring semesters to complete a year-long thesis project. Students must apply for this Distinction sequence by February 15 of the junior year. Applicants must have completed at least two Literature Program courses and one course in the literature of a foreign language and have a minimum B+ average in those courses. Applicants should apply to the director of undergraduate studies and must include a writing sample, a letter from one of their instructors, and the name of a thesis advisor. The Literature Program's Distinction Committee, composed of three faculty members—the thesis advisor, the instructor of the senior seminar, and the director of undergraduate studies—will evaluate the applications and the final theses themselves. Students not awarded distinction will receive graded credit for Literature 190.

## **Management Sciences Courses (MS)**

The courses listed below are elective courses, which do not count for area of knowledge requirements in Trinity College. Neither a major nor a minor is offered in management sciences. The courses may be helpful in preparation for graduate education in business and law and may provide liberal arts, science, and engineering students an advancement in placement. For courses in accounting, see Economics.

**120. Managerial Effectiveness.** Understanding the nature of management and the factors that influence the effective performance of managers. Topics include the nature of managerial effectiveness; managing groups; leadership strategies; performance motivation and appraisal; conflict management; the manager as decision maker and negotiator. Prerequisites: junior standing. One course. *Staff*

**161. Marketing Management.** The role of the marketing function in business; product planning, price, promotion, and distribution as elements of a total marketing mix. Formal models in solving the marketing mix problem of the firm. Prerequisites: junior standing. One course. *Staff*

**193, 194. Independent Study.** Directed reading and research. Open only to qualified juniors and seniors with consent of instructor and director of undergraduate studies. One course each. *Staff*

## Marine Biology

For courses in marine biology, see Biology, Environment (Nicholas School), and the University Program in Marine Sciences.

## University Program in Marine Sciences

Professor Ramus (botany and environment), *Director*; Professor Forward (environment and zoology), *Assistant Director and Director of Undergraduate Studies*; Professors Barber (botany, earth and ocean sciences, environment, and zoology), C. Bonaventura (cell biology and environment), J. Bonaventura (cell biology and environment), Crowder (environment and zoology), Associate Professor Rittschof (environment and zoology); Professor Emeritus Bookhout (zoology); Professor of the Practice Orbach (environment); Associate Professor of the Practice Kirby-Smith (environment); Assistant Professor of the Practice Read (environment); Assistant Research Professor McClellan-Green (environment)

The interdisciplinary program in marine sciences provides students with a unique opportunity to live and study at the Duke University Nicholas School of the Environment Marine Laboratory for a full academic semester fall or spring or during the summer terms. The program emphasizes small class size, independent study, and integrated classroom, laboratory, and field experience. Students have daily access to modern scientific equipment, a specialized library, and the surrounding marine environment.

The fall and spring semesters are designed for juniors and seniors. Participation in either the fall or spring semester is possible for all majors with appropriate preparation. Before attending a semester program, it is advised that students complete introductory college courses in biology, chemistry, and mathematics. Students wishing to apply to the fall or the spring semester must submit a completed application to the Admissions Office, Duke University Nicholas School of the Environment, Marine Laboratory, 135 Duke Marine Lab Road, Beaufort, North Carolina 28516-9721. Most applications are received prior to Duke's registration period for the desired semester. Students will be notified of the action of the Admissions Committee shortly after receipt of applications.

The summer curriculum, taught in two terms, includes a rich assortment of courses in the natural and social sciences. Attention is also directed to the introductory course in marine biology (Biology 10L), designed specifically for students not majoring in a natural science. Applications for summer courses must be accompanied by a current academic transcript and sent to the address indicated above. Most applications are submitted by the end of March; however, those students interested in being considered for a summer tuition scholarship must, by March 1, submit their application and meet other specific requirements outlined in the 1998-99 *Bulletin of the Duke University Marine Laboratory*. Students may also contact the Marine Laboratory admissions office for more information.

## THE BEAUFORT TO BERMUDA SEMESTER

The Marine Laboratory (Beaufort, North Carolina) in cooperation with the Bermuda Biological Station for Research (Ferry Reach, Bermuda) offers a one-semester international study in environmental science and policy at two distinctive locations: Beaufort on the North



Carolina coastal plain with its marshlands, estuaries, continental shelf, and the Gulf Stream; Bermuda with its intertidal coral reefs and subtropical mid-ocean environment in the Sargasso Sea. Emphasis is placed on the rigorous application of the natural and social sciences to the contrasting marine ecosystems and to basic processes and human interventions in the different oceanic systems. The program draws from two marine laboratory traditions in experiential learning for undergraduates and from the expertise of two resident faculties.

The program is designed for undergraduates in their third or fourth year of study who have completed the designated prerequisites in the natural and social sciences. Students will reside at each campus for one-half semester. During the compressed seven-week session, they will take two intensive courses selected from among five courses offered at each campus. One group will begin the program in Beaufort, the other in Bermuda. At mid-semester, the groups will trade campuses. Enrollment is limited. Early application is recommended. Further information may be obtained from the admissions office at Beaufort (919-504-7502).

## FALL, SPRING, OR SUMMER COURSES AT BEAUFORT

The courses below are described in the bulletin listings of the specified departments. See also the 1998-99 *Bulletin of the Duke University Marine Laboratory* and the Duke University Official Schedule of Courses for the current schedule of courses. For information on courses fulfilling requirements of the biology, environmental studies and policy, or earth and ocean sciences major consult the director of undergraduate studies for the major.

### Biology

10L. Marine Biology. *Kenney*

114L. Biological Oceanography. Prerequisite: Biology 25L. *Ramus or staff (Beaufort); Nelson and Steinberg (Bermuda)*

123. Analysis of Ocean Ecosystems. Prerequisite: one year of biology, one year of chemistry, or consent of instructor. *Barber*

126. Marine Mammals. Prerequisite: introductory biology. *Read or staff*

126L. Marine Mammals. Prerequisite: introductory biology. *Read or staff*

129L. Marine Ecology. Prerequisite: introductory biology. *Crowder or Kirby-Smith (Beaufort); Lipschultz, McKenna, and Smith (Bermuda)*

150L. Physiology of Marine Animals. Prerequisites: Biology 25L and Chemistry 12L. *Forward*

155L. Biochemistry of Marine Animals. Prerequisites: Biology 25L; and Chemistry 11L, 12L. *McClellan-Green (spring); Rittschof (fall and summer)*

176L. Marine Invertebrate Zoology. Prerequisite: Biology 25L. *Dimock (Beaufort) or Kirby-Smith (Beaufort); Barnes and Coates (Bermuda)*

218L. Barrier Island Ecology. Prerequisite: Biology 25L or equivalent; suggested: course in botany or ecology. (Cross-listed.) *Evans, Peterson, and Wells (visiting summer faculty)*

### Cell Biology

210. Independent Study. *Staff*

243. Environmental Biochemistry. Prerequisite: organic chemistry. (Cross-listed.) *C. Bonaventura*

244L. Molecular and Cellular Processes in Marine Organisms. Prerequisite: organic chemistry. (Cross-listed.) *C. Bonaventura and McClellan-Green*

### Earth and Ocean Sciences

202. Beach and Island Geological Processes. *Pilkey*

205. Geological Oceanography. (Cross-listed.) *Staff*

### Environment

121. Climate Change: A Global Perspective. Prerequisite: one year of chemistry. *Malmquist and Murnane*

122S. Climate-Related Hazards and Humanity. *Malmquist*

125. Remote Sensing and Long-term Environmental Monitoring. *Nelson*

132S. Current Topics in Oceanography and Marine Biology. Prerequisite: introductory biology. *Staff*

133S. Molecular Approaches to Questions of Physiology, Ecology, and Evolution in the Marine Environment. Prerequisite: introductory biology. *Trapido-Rosenthal*



- 134L. Biological Cycles in the Ocean. Prerequisites: introductory biology and introductory chemistry. *Bates and Carlson*
140. A Scientist's Perspective on Environmental Principles, Policy, and Legislation. *Bates and Connelly*
- 208L. Estuarine Ecosystem Processes. Prerequisite: ecology, systematics, or field biology course or consent of instructor. *Kirby-Smith*
209. Conservation Biology and Policy. Prerequisites: introductory biology; suggested: a policy and/or introductory ecology course. *Crowder (Beaufort) and Rubenstein (visiting summer faculty)*
- 218L. Barrier Island Ecology. Prerequisite: Biology 25L or equivalent; suggested: course in botany or ecology. (Cross-listed.) *Evans, Peterson, and Wells (visiting summer faculty)*
- 225L. Coastal Ecotoxicology and Pollution. Prerequisites: introductory chemistry and biology. *Kenney*
243. Environmental Biochemistry. Prerequisite: organic chemistry. (Cross-listed.) *C. Bonaventura*
- 244L. Molecular and Cellular Processes in Marine Organisms. Prerequisite: organic chemistry. (Cross-listed.) *C. Bonaventura and McClellan-Green*
- 256S. Seminar in Ocean Sciences. *Staff*
- 269S. Advanced Topics in Marine Ecology. *Crowder*
273. Marine Fisheries Policy. *Orbach*
276. Marine Policy. (Cross-listed.) *Orbach*
291. Geological Oceanography. (Cross-listed.) *Staff*

#### Public Policy Studies

197. Marine Policy. (Cross-listed.) *Orbach*

#### Special Topics Courses

- Biology 191, 192. Independent Study. One course each. *Staff*
- Biology 193T, 194T. Tutorial. One course each. *Staff*
- Biology 295S/296S.08. Marine Animal Navigation. Half course. *Forward*
- Biology 295S/296S.24. Light in the Sea. Half course. *Ramus*
- Biology 295S/296S.26. The Ecology of Chemical Signals. Half course. *Rittschof*
- Biology 295S/296S.54. Human Impact on the Natural Environment. Half course. *Barber*
- Environment 191, 192. Independent Study. One course each. *Staff*
- Geology 191, 192. Independent Study. One course each. *Staff*
- Geology 195. Independent Study for Nonmajors. One course. *Staff*

## Markets and Management Studies

Professor Gereffi, *Director*

A certificate, but not a major, is available in this program.

The program offers students the opportunity to take a cluster of courses dealing with problems of how organizations are formed and managed, how transactions between people and organizations are structured in markets, how and why patterns of consumption change, what distinguishes good from bad management in both the practical and ethical sense, how approaches to management and marketing have changed over time, and how these approaches vary from one country and one sector of the economy to another. The program is designed to meet the needs of Duke undergraduates who wish to combine their current course of study with preparation for careers in business and management, or related graduate study.

In addition to offering courses and a certificate on completion of the requirements, the Markets and Management Studies Program also sponsors lectures, films, discussions and internships. Students are invited to make use of a resource room (Room 256 in the Sociology-Psychology Building) for meetings with faculty and other students in the program, and to consult relevant journals and newspapers. Additional information may be obtained from Professor Gereffi or the program coordinator in the sociology department.

### COURSE OF STUDY

The course of study for program participants is intended to be interdisciplinary. The core of the program consists of sociology courses, with a large number of electives available for

selection from eight other departments. The certificate requires six courses, two of which must be drawn from a core set of management and markets studies courses. The third core course is the capstone course, an integrative course taken in the senior year. The rest of the courses are considered electives. For students who matriculated at Duke before fall 1998, at least two of these must be taken in departments other than sociology. For students entering Duke in the fall 1998 or thereafter, no more than three of the six courses taken to satisfy the requirements of the certificate may originate in a single department.

## PROGRAM COURSES

### Core Courses

Sociology 142. Organizations and Global Competitiveness.  
 Sociology 144. Organizations and Environments.  
 Sociology 155. Organizations and Management.  
 Sociology 158. Markets and Marketing.  
 Sociology 159. The Sociology of Entrepreneurship.  
 Sociology 190. Markets and Management.

### Elective Courses

Cultural Anthropology 110. Advertising and Society: Global Perspective  
 Economics 130. The Changing Role of the Market in the Social System  
 Economics 134. Japanese Economy and Its History  
 Economics 140. Comparative Economic Systems  
 Economics 142S. Chinese Economy in Transition  
 Economics 165. American International Economic Policy  
 Economics 167. Multinational Management  
 Economics 173. Economics of Organization and Management  
 Economics 181. Corporate Finance  
 Economics 183. Agency and Accounting  
 Economics 188. Industrial Organization  
 Economics 189. Business and Government  
 Education 140. The Psychology of Work  
 Engineering 171. Total Quality Systems  
 History 143B. The Emergence of Modern Japan  
 Management Science 120. Managerial Effectiveness  
 Management Science 161. Marketing Management  
 Political Science 113A. Issues of International Political Economy I: International Trade  
 Political Science 113B. Issues of International Political Economy II: Money and Finance  
 Political Science 164. Political Organizations  
 Public Policy Studies 138S. Public-Private Leadership  
 Public Policy Studies 139S. Business Leadership, Social Responsibility, and Public Policy  
 Public Policy Studies 145D. Leadership, Policy, and Change  
 Public Policy Studies 146. Leadership Development  
 Religion 181. Ethical Issues in Social Change and Public Policy  
 Science, Technology and Human Values 112S, 113S. Special Topics in Science, Technology, and Human Values  
 Sociology 110B.01. Comparative Sociology: Asia  
 Sociology 112. American Demographics  
 Sociology 126. Third World Development  
 Sociology 141. Consuming Passions  
 Sociology 143. Management and Labor Relations  
 Sociology 145. Nations, Regions, and the Global Economy  
 Sociology 146. Organizational and Occupational Deviance  
 Sociology 156. Global Contexts of Science and Technology  
 Sociology 165. Occupations, Professions, and Careers  
 Sociology 191-192. Markets and Management Studies Internship

## Mathematics (MTH)

Professor Harer, *Chair*; Professor Pardon, *Associate Chair*; Associate Professor Layton, *Director of Undergraduate Studies*; Assistant Professor of the Practice Blake, *Supervisor of First-year Instruction*; Professors Allard, Beale, Bryant, Hain, Lawler, Morrison, Reed, Rose, Schaeffer, Stern, Trangenstein, Venakides, and Weisfeld; Associate Professors Bertozzi, Burdick, R. Hodel, Kitchen, Kraines, Moore, Saper, Schoen, Scoville, Smith, and Zhou; Assistant

Professors Aspinwall and Plessner; Professors Emeriti Carlitz, Shoenfield, and Warner; Associate Professor of the Practice Bookman; Research Assistant Professors Carmack, Constantinescu, and Hayes; Adjunct Professors Shearer and Wahl; Lecturers Fitchett, M. Hodel, and Tomberg

A major or minor is available in this department.

**19. Precalculus Mathematics. (QR)** For students with CB Achievement Test scores between 460 and 540 or SAT scores between 500 and 600. Selected topics in algebra, trigonometry, and analytic geometry; projects and writing assignments. Designed to increase the mathematical skills and knowledge of students planning to enroll in Mathematics 31. Not open to students who have credit for Mathematics 25L or 26L. One course. *Staff*

**25L. Laboratory Calculus and Functions I. (QR)** A study of functions with applications, and an introduction to differential calculus, with a laboratory component. Topics include a review of algebra and functions, mathematical modeling with elementary functions, rates of change, inverse functions, logarithms and exponential functions, the derivative, graphical interpretations of the derivative, optimization, related rates. Not open to students who have credit for Mathematics 19 or 31 or 31L. One course. *Staff*

**26L. Laboratory Calculus and Functions II. (QR)** A continuation of Mathematics 25L. Topics include zeros of functions, antidifferentiation, initial value problems, differential equations, Euler's method, slope fields, review of trigonometry, modeling with trigonometric functions, Riemann sums, the Fundamental Theorem of Calculus, integration by substitution, integration by parts, separation of variables, systems of differential equations. Students who complete this course can enroll in Mathematics 32L. Not open to students who have credit for Mathematics 31 or 31L. Prerequisite: Mathematics 25L. One course. *Staff*

**31. Introductory Calculus I. (QR)** Functions, limits, continuity, trigonometric functions, techniques and applications of differentiation, indefinite and definite integrals, the fundamental theorem. One course. *Staff*

**31L. Laboratory Calculus I. (QR)** Introductory calculus with a laboratory component. Emphasis on laboratory projects, group work, and written reports. Differentiation, transcendental functions, optimization, differential equations, numerical approximations, Euler's method, the Fundamental Theorem, separation of variables, slope fields, and mathematical modeling. Not open to students who have credit for Mathematics 25L or 26L. One course. *Staff*

**32. Introductory Calculus II. (QR)** Transcendental functions, techniques and applications of integration, indeterminate forms, improper integrals, infinite series. Not open to students who have had Mathematics 32L or 41. Prerequisite: Mathematics 31. One course. *Staff*

**32L. Laboratory Calculus II. (QR)** Second semester of introductory calculus with a laboratory component. Emphasis on laboratory projects, group work, and written reports. Methods of integration, applications of integrals, functions defined by integration, improper integrals, introduction to probability and distributions, infinite series, Taylor polynomials, series solutions of differential equations, systems of differential equations, Fourier series. Not open to students who have had Mathematics 32 or 41. Prerequisite: Mathematics 26L or 31L or consent of instructor. One course. *Staff*

**32X. Introductory Honors Calculus II. (QR)** Similar to Mathematics 32, but faster paced and more challenging. Open to students who score at least 750 on the SAT Mathematics Aptitude Test. One course. *Staff*

**41. One Variable Calculus. (QR)** Meets five times a week, quickly reviews differential calculus and then covers integral calculus and infinite series. Designed for first-year students



who have had a year of calculus in high school and have Mathematics SAT scores of 650 or above, but who have not received advanced placement credit for Mathematics 31. Not open to students who have had Mathematics 32 or 32L. One course. *Staff*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**103. Intermediate Calculus. (QR)** Partial differentiation, multiple integrals, and topics in differential and integral vector calculus, including Green's theorem, the divergence theorem, and Stokes's theorem. Prerequisite: Mathematics 32, 32L, or 41. One course. *Staff*

**103L. Laboratory Calculus III. (QR)** Intermediate calculus with a computer laboratory. Emphasis on projects, group work, and written reports. Curves in space, partial differentiation, multiple integrals, two-dimensional vector calculus. Prerequisite: Mathematics 32, 32L, or 41, or consent of instructor. One course. *Staff*

**103X, 104X. Honors Intermediate Calculus and Linear Algebra. (QR)** Similar to Mathematics 103, 104, but more theoretical. Students who have taken 32X are encouraged to enroll. Students continuing from 103X should take 104X rather than 104. One course each. *Staff*

**104. Linear Algebra and Applications. (QR)** Systems of linear equations and elementary row operations, Euclidean  $n$ -space and subspaces, linear transformations and matrix representations, Gram-Schmidt orthogonalization process, determinants, eigenvectors and eigenvalues; applications. Prerequisite: Mathematics 32, 32L, or 41. One course. *Staff*

**111. Applied Mathematical Analysis I. (QR)** First and second order differential equations with applications; matrices, eigenvalues, and eigenvectors; linear systems of differential equations; Fourier series and applications to partial differential equations. Intended primarily for engineering and science students with emphasis on problem solving. Not open to students who have had Mathematics 131. Prerequisite: Mathematics 103. One course. *Staff*

**114. Applied Mathematical Analysis II. (QR)** Boundary value problems, complex variables, Cauchy's theorem, residues, Fourier transform, applications to partial differential equations. Not open to students who have had Mathematics 133, 181, or 211. Prerequisites: Mathematics 111 or 131, or 103 and consent of instructor. One course. *Staff*

**120S. Introduction to Theoretical Mathematics. (QR)** Topics from set theory, number theory, algebra, and analysis. Recommended for prospective mathematics majors who feel the need to improve skills in logical reasoning and theorem-proving before taking Mathematics 121 and 139. Not open to students who have had Mathematics 121, Mathematics 139, or equivalents. Prerequisite: Mathematics 103; corequisite: Mathematics 104. Half course. *Staff*

**121. Introduction to Abstract Algebra. (QR)** Groups, rings, and fields. Students intending to take a year of abstract algebra should take Mathematics 200 and 201. Not open to students who have had Mathematics 200. Prerequisite: Mathematics 104 or 111. One course. *Staff*

**123S. Geometry. (QR)** Euclidean geometry, inverse and projective geometries, topology (Möbius strips, Klein bottle, projective space), and non-Euclidean geometries in two and three dimensions; contributions of Euclid, Gauss, Lobachevsky, Bolyai, Riemann, and Hilbert. Prerequisite: Mathematics 32, 32L, 41, or consent of instructor. One course. *Staff*

**124. Combinatorics. (QR)** Permutations and combinations, generating functions, recurrence relations; topics in enumeration theory, including the Principle of Inclusion-Exclusion and Polya Theory; topics in graph theory, including trees, circuits, and matrix representations; applications. Prerequisite: Mathematics 104 or consent of instructor. One course. *Staff*



**126. Introduction to Linear Programming and Game Theory. (QR)** Fundamental properties of linear programs; linear inequalities and convex sets; primal simplex method, duality; integer programming; two-person and matrix games. Prerequisite: Mathematics 104. One course. *Staff*

**128. Number Theory. (QR)** Divisibility properties of integers, prime numbers, congruences, quadratic reciprocity, number-theoretic functions, simple continued fractions, rational approximations; contributions of Fermat, Euler, and Gauss. Prerequisite: Mathematics 32, 32L, 41, or consent of instructor. One course. *Staff*

**128S. Number Theory. (QR)** Same as Mathematics 128, but offered as a seminar. One course. *Staff*

**131. Elementary Differential Equations. (QR)** First and second order differential equations with applications; linear systems of differential equations; Fourier series and applications to partial differential equations. Additional topics may include stability, nonlinear systems, bifurcations, or numerical methods. Not open to students who have had Mathematics 111. Prerequisite: Mathematics 103; corequisite: Mathematics 104. One course. *Staff*

**132S. Nonlinear Ordinary Differential Equations. (QR)** Theory and applications of systems of nonlinear ordinary differential equations. Topics may include qualitative behavior, numerical experiments, oscillations, bifurcations, deterministic chaos, fractal dimension of attracting sets, delay differential equations, and applications to the biological and physical sciences. Prerequisite: Mathematics 111 or 131 or consent of instructor. One course. *Staff*

**133. Introduction to Partial Differential Equations. (QR)** Heat, wave, and potential equations: scientific context, derivation, techniques of solution, and qualitative properties. Topics to include Fourier series and transforms, eigenvalue problems, maximum principles, Green's functions, and characteristics. Intended primarily for mathematics majors and those with similar backgrounds. Not open to students who have had Mathematics 114 or 211. Prerequisite: Mathematics 111 or 131 or consent of instructor. One course. *Staff*

**135. Probability. (QR)** Probability models, random variables with discrete and continuous distributions. Independence, joint distributions, conditional distributions. Expectations, functions of random variables, central limit theorem. Prerequisite: Mathematics 103. C-L: Statistics 104. One course. *Staff*

**136. Statistics. (QR)** Sampling distributions, point and interval estimation, maximum likelihood estimators. Tests of hypotheses, the Neyman-Pearson theorem. Bayesian methods. Not open to students who have had Statistics 112 or 213. Prerequisites: Mathematics 104 and 135. C-L: Statistics 114. One course. *Staff*

**139. Advanced Calculus I. (QR)** Algebraic and topological structure of the real number system; rigorous development of one-variable calculus including continuous, differentiable, and Riemann integrable functions and the Fundamental Theorem of Calculus; uniform convergence of a sequence of functions; contributions of Newton, Leibniz, Cauchy, Riemann, and Weierstrass. Not open to students who have had Mathematics 203. Prerequisite: Mathematics 103. One course. *Staff*

**149S. Problem Solving Seminar. (QR)** Techniques for attacking and solving challenging mathematics problems and writing mathematical proofs. Course may be repeated. Consent of instructor required. Half course. *Staff*

**150. Topics in Mathematics from a Historical Perspective. (QR)** Content of course determined by instructor. Prerequisite: Mathematics 139 or 203 or consent of instructor. One course. *Staff*

**150S. Topics in Mathematics from a Historical Perspective. (QR)** Same as Mathematics 150, but offered as a seminar. One course. *Staff*

**160. Mathematical Numerical Analysis. (QR)** Zeros of functions; polynomial interpolation and splines; numerical integration and differentiation; applications to ordinary differential equations; numerical linear algebra; error analysis; extrapolation and acceleration. Not open to students who have had Computer Science 150 or 250. Prerequisites: Mathematics 103 and 104 and knowledge of an algorithmic programming language, or consent of instructor. One course. *Staff*

**181. Complex Analysis. (QR)** Complex numbers, analytic functions, complex integration, Taylor and Laurent series, theory of residues, argument and maximum principles, conformal mapping. Not open to students who have had Mathematics 114 or 212. Prerequisite: Mathematics 139 or 203. One course. *Staff*

**187. Introduction to Mathematical Logic. (QR)** Propositional calculus; predicate calculus. Gödel completeness theorem, applications of number theory, incompleteness theorem, additional topics in proof theory or computability; contributions of Aristotle, Boole, Frege, Hilbert, and Gödel. Prerequisites: Mathematics 103 and 104 or Philosophy 103. One course. *Staff*

**188. Logic and Its Applications. (QR)** Topics in proof theory, model theory, and recursion theory; applications to computer science, formal linguistics, mathematics, and philosophy. Usually taught jointly by faculty members from the departments of computer science, mathematics, and philosophy. Prerequisite: a course in logic or consent of instructor. C-L: Computer Science 148 and Philosophy 150. One course. *Staff*

**191, 192. Independent Study.** Directed reading and research. Admission by consent of instructor and director of undergraduate studies. One course each. *Staff*

**193, 194. Independent Study.** Same as 191, 192, but for seniors. One course each. *Staff*

**196S. Seminar in Mathematical Modeling. (QR)** Introduction to techniques used in the construction, analysis, and evaluation of mathematical models. Individual modeling projects in biology, chemistry, economics, engineering, medicine, or physics. Prerequisite: Mathematics 111 or 131 or consent of instructor. One course. *Staff*

**197S. Seminar in Mathematics. (QR)** Intended primarily for juniors and seniors majoring in mathematics. Topics vary. Prerequisites: Mathematics 103 and 104. One course. *Staff*

**198S, 199S. Honors Seminar in Mathematics. (QR)** Topics vary. Consent of instructor and director of undergraduate studies required. One course each. *Staff*

### **For Seniors and Graduates**

**200. Introduction to Algebraic Structures I. (QR)** Laws of composition, groups, rings; isomorphism theorems; axiomatic treatment of natural numbers; polynomial rings; division and Euclidean algorithms. Not open to students who have had Mathematics 121. Prerequisite: Mathematics 104 or equivalent. One course. *Staff*

**201. Introduction to Algebraic Structures II. (QR)** Vector spaces, matrices and linear transformations, fields, extensions of fields, construction of real numbers. Prerequisites: Mathematics 200, or Mathematics 121 and consent of instructor. One course. *Staff*

**203. Basic Analysis I. (QR)** Topology of  $R^n$ , continuous functions, uniform convergence, compactness, infinite series, theory of differentiation, and integration. Not open to students who have had Mathematics 139. Prerequisite: Mathematics 104. One course. *Staff*

- 204. Basic Analysis II. (QR)** Inverse and implicit function theorems, differential forms, integrals on surfaces, Stokes' theorem. Not open to students who have had Mathematics 140. Prerequisites: Mathematics 203, or Mathematics 139 and consent of instructor. One course. *Staff*
- 205. Topology. (QR)** Elementary topology, surfaces, covering spaces, Euler characteristic, fundamental group, homology theory, exact sequences. Prerequisite: Mathematics 104. One course. *Staff*
- 206. Differential Geometry. (QR)** Geometry of curves and surfaces, the Serret-Frenet frame of a space curve, the Gauss curvature, Cadazzi-Mainardi equations, the Gauss-Bonnet formula. Prerequisite: Mathematics 104. One course. *Staff*
- 211. Mathematical Methods in Physics and Engineering I. (QR)** Heat and wave equations, initial and boundary value problems, Fourier series, Fourier transforms, potential theory. Not open to students who have had Mathematics 133 or 230. Prerequisite: Mathematics 114 or equivalent. One course. *Staff*
- 212. Mathematical Methods in Physics and Engineering II. (QR)** Green's functions, partial differential equations in several space dimensions. Complex variables, analytic functions, Cauchy's theorem, residues, contour integrals. Other topics may include method of characteristics, perturbation theory, calculus of variations, or stability of equilibria. Not open to students who have taken the former Mathematics 231. Prerequisite: Mathematics 114, 133, or 211. One course. *Staff*
- 216. Applied Stochastic Processes. (QR)** An introduction to stochastic processes without measure theory. Topics selected from: Markov chains in discrete and continuous time, queueing theory, branching processes, martingales, Brownian motion, stochastic calculus. Not open to students who have taken Mathematics 240. Prerequisite: Mathematics 135 or equivalent. C-L: Statistics 253. One course. *Staff*
- 217. Linear Models. (QR)** Corequisite: Statistics 213 or equivalent. See C-L: Statistics 244. One course. *Staff*
- 218. Introduction to Multivariate Statistics. (QR)** Not open to students who have taken the former Mathematics 242. Prerequisite: Statistics 244 or equivalent. See C-L: Statistics 245. One course. *Burdick*
- 221. Numerical Analysis. (QR)** Prerequisites: knowledge of an algorithmic programming language, intermediate calculus including some differential equations, and Mathematics 104. See C-L: Computer Science 250; also C-L: Statistics 273. One course. *Rose or Sun*
- 222. Numerical Methods for Partial Differential Equations. (QR)** Prerequisite: Computer Science 250. See C-L: Computer Science 252. One course. *Rose or Sun*
- 223. Numerical Linear Algebra. (QR)** Prerequisite: Computer Science 250 or equivalent. See C-L: Computer Science 254. One course. *Rose or Sun*
- 224. Scientific Computing I. (QR)** Well-posedness of ODEs; method, order, and stability. Methods for hyperbolic, parabolic, and elliptic PDEs. Structured programming and graphical user interfaces. Programming in C++, C, and Fortran. Prerequisites: Mathematics 103, plus some familiarity with ODEs and PDEs. One course. *Staff*
- 225. Scientific Computing II. (QR)** Compressible fluid flow. Shock-capturing methods for conservation laws. Incompressible fluid flow. Vortex and probabilistic methods for high Re flow. Viscous Navier-Stokes equations and projection methods. Prerequisite: Mathematics 224. One course. *Staff*



**226. Topics in Numerical Analysis. (QR)** Numerical solution of ordinary or partial differential equations, unconstrained and constrained nonlinear optimization, finite element methods, computational methods for hyperbolic conservation laws. Prerequisite: Mathematics 221 or consent of instructor. One course. *Staff*

**229. Mathematical Modeling. (QR)** Formulation and analysis of mathematical models in science and engineering. Emphasis on case studies; may include individual or team research projects. One course. *Staff*

**231. Ordinary Differential Equations. (QR)** Existence and uniqueness theorems for nonlinear systems, well-posedness, two-point boundary value problems, phase plane diagrams, stability, dynamical systems, and strange attractors. Not open to students who have taken the former Mathematics 296. Prerequisites: Mathematics 104, 111 or 131, and 203 or 139. One course. *Staff*

**232. Partial Differential Equations I. (QR)** Fundamental solutions of linear partial differential equations, hyperbolic equations, characteristics, Cauchy-Kowalevski theorem, propagation of singularities. Not open to students who have taken the former Mathematics 297. Prerequisite: Mathematics 204 or equivalent. One course. *Staff*

**233. Asymptotic and Perturbation Methods. (QR)** Asymptotic solution of linear and nonlinear ordinary and partial differential equations. Asymptotic evaluation of integrals. Singular perturbation. Boundary layer theory. Multiple scale analysis. Prerequisite: Mathematics 114 or equivalent. One course. *Staff*

**238, 239. Topics in Applied Mathematics. (QR)** Conceptual basis of applied mathematics, graph theory, game theory, mathematical programming, numerical analysis, or problems drawn from industry or from academic science or engineering. Prerequisites: Mathematics 103 and 104 or equivalents. One course each. *Staff*

**241. Real Analysis I. (QR)** Measures; Lebesgue integral;  $L^p$  spaces; Daniell integral, differentiation theory, product measures. Not open to students who have taken the former Mathematics 281. Prerequisite: Mathematics 204 or equivalent. One course. *Staff*

**242. Real Analysis II. (QR)** Metric spaces, fixed point theorems, Baire category theorem, Banach spaces, fundamental theorems of functional analysis, Fourier transform. Not open to students who have taken the former Mathematics 282. Prerequisite: Mathematics 241 or equivalent. One course. *Staff*

**245. Complex Analysis. (QR)** Complex calculus, conformal mapping, Riemann mapping theorem, Riemann surfaces. Not open to students who have taken Mathematics 285. Prerequisite: Mathematics 204 or equivalent. One course. *Staff*

**251. Groups, Rings, and Fields. (QR)** Groups including nilpotent and solvable groups,  $p$ -groups and Sylow theorems; rings and modules including classification of modules over a PID and applications to linear algebra; fields including extensions and Galois theory. Not open to students who have taken Mathematics 260. Prerequisite: Mathematics 201 or equivalent. One course. *Staff*

**252. Commutative Algebra. (QR)** Extension and contraction of ideals, modules of fractions, primary decomposition, integral dependence, chain conditions, affine algebraic varieties, Dedekind domains, completions. Not open to students who have taken the former Mathematics 261. Prerequisite: Mathematics 251 or equivalent. One course. *Staff*

**254. Topics in Algebra. (QR)** Algebraic number theory, algebraic  $K$ -theory, homological algebra, or other topics. Prerequisite: Mathematics 251. One course. *Staff*

**257. Mathematical Logic. (QR)** First-order logic, completeness theorem, compactness theorem, introduction to recursive functions, incompleteness theorem. Not open to students



who have taken Mathematics 250. Prerequisite: Mathematics 187 or 200 or equivalent. One course. *Staff*

**261. Algebraic Topology I. (QR)** Fundamental group and covering spaces, singular and cellular homology, Eilenberg-Steenrod axioms of homology, Euler characteristic, classification of surfaces, singular and cellular cohomology. Not open to students who have taken Mathematics 271. Prerequisites: Mathematics 200 and 205 or consent of instructor. One course. *Staff*

**262. Algebraic Topology II. (QR)** Universal coefficient theorems, Künneth theorem, cup and cap products, Poincaré duality, plus topics selected from: higher homotopy groups, obstruction theory, Hurewicz and Whitehead theorems, and characteristic classes. Prerequisite: Mathematics 261 or consent of instructor. One course. *Staff*

**263, 264. Topics in Topology. (QR)** Algebraic, geometric, or differential topology. Consent of instructor required. One course each. *Staff*

**267. Differential Geometry. (QR)** Differentiable manifolds, fiber bundles, connections, curvature, characteristic classes, Riemannian geometry including submanifolds and variations of the length integral, complex manifolds, homogeneous spaces. Not open to students who have taken Mathematics 275. Prerequisites: Mathematics 204 and 251 or equivalents. One course. *Staff*

**268. Topics in Differential Geometry. (QR)** Lie groups and related topics, Hodge theory, index theory, minimal surfaces, Yang-Mills fields, exterior differential systems, several complex variables. Prerequisite: Mathematics 267 or consent of instructor. One course. *Staff*

**273. Algebraic Geometry. (QR)** Local theory: affine varieties, algebraic and topological theory of singularities. Global theory over the complex numbers: Riemann surfaces, Jacobians, Kähler manifolds, Hodge theory, theorems of Lefschetz and Kodaira. Prerequisite: Mathematics 252 or equivalent. One course. *Staff*

**277. Topics in Algebraic Geometry. (QR)** Projective varieties and the theory of extremal rays, classification of surfaces and higher-dimensional varieties, variation of Hodge structure and moduli problems, schemes and arithmetic varieties, or other advanced topics. Prerequisite: Mathematics 273 or consent of instructor. One course. *Staff*

**278. Topics in Complex Analysis. (QR)** Geometric function theory, function algebras, several complex variables, uniformization, or analytic number theory. Prerequisite: Mathematics 245 or equivalent. One course. *Staff*

**279. Topics in Mathematical Physics. (QR)** Topics selected from: critical phenomena and statistical mechanics, mathematical aspects of quantum field theory, string and superstring theories, or other areas of mathematical physics. One course. *Staff*

**281. Partial Differential Equations II. (QR)** Linear wave motion, dispersion, stationary phase, foundations of continuum mechanics, characteristics, linear hyperbolic systems, and nonlinear conservation laws. Not open to students who have taken the former Mathematics 298. Prerequisite: Mathematics 232 or equivalent. One course. *Staff*

**282. Partial Differential Equations III. (QR)** Fourier transforms, distributions, elliptic equations, singular integrals, layer potentials, Sobolev spaces, regularity of elliptic boundary value problems. Prerequisites: Mathematics 232 and 241 or equivalent. One course. *Staff*

**283, 284. Topics in Partial Differential Equations. (QR)** Hyperbolic conservation laws, pseudo-differential operators, variational inequalities, theoretical continuum mechanics. Prerequisite: Mathematics 281 or equivalent. One course each. *Staff*

**287. Probability. (QR)** Random variables, independence, expectations, laws of large numbers, central limit theorem, martingales, Brownian motion. Not open to students who have taken Mathematics 290. Prerequisite: Mathematics 241 or equivalent. C-L: Statistics 207. One course. *Staff*

**288. Topics in Probability Theory. (QR)** Brownian motion, diffusion processes, random walks, and applications to differential equations and mathematical physics. Prerequisite: Mathematics 287 or consent of instructor. C-L: Statistics 297. One course. *Staff*

**295, 296. Special Topics. (QR)** One course each. *Staff*

**297, 298. Special Readings. (QR)** One course each. *Staff*

## COURSES CURRENTLY UNSCHEDULED

**135S. Probability. (QR)**

**140. Advanced Calculus II. (QR)**

**140S. Advanced Calculus II. (QR)**

**160S. Mathematical Numerical Analysis. (QR)**

**171S. Elementary Topology. (QR)**

**248. Topics in Analysis. (QR)**

**249. Topics in Functional Analysis. (QR)**

## THE MAJOR

The Department of Mathematics offers both the A.B. degree and the B.S. degree. Students who plan to attend graduate school in mathematics or the sciences should consider working toward the B.S. degree, which requires at least eight courses in mathematics numbered above Mathematics 111. The A.B. degree requires at least six and one-half courses in mathematics numbered above Mathematics 111. The specific requirements for each degree are listed below.

Mathematics 120S is a half-course recommended for prospective mathematics majors who feel the need to improve skills in logical reasoning and theorem-proving before taking Mathematics 121 and 139. Ideally, Mathematics 120S should be taken before the junior year and concurrently with Mathematics 103 or Mathematics 104. Students working toward the A.B. degree who do not take Mathematics 120S will usually fulfill their major requirements by taking at least seven full courses in mathematics numbered above Mathematics 111.

The director of undergraduate studies can be consulted for additional information and advice on course selection. The *Handbook for Mathematics Majors and Minors*, published by the department, can be used as a guide in developing a coherent program of study consistent with professional goals.

### For the A.B. Degree

*Prerequisites.* Mathematics 31 or 31L or an equivalent course (Advanced Placement allowed); Mathematics 32 or 32L or 41 or an equivalent course (Advanced Placement allowed); Mathematics 103 and Mathematics 104 or equivalent courses. (Many upper-level mathematics courses assume programming experience at the level of Computer Science 4. Students without computer experience are encouraged to take Computer Science 6.)

*Major Requirements.* Six and one-half courses in mathematics numbered above 111 including Mathematics 121 or 200 and Mathematics 139 or 203.

### For the B.S. Degree

*Prerequisites.* Mathematics 31 or 31L or an equivalent course (Advanced Placement allowed); Mathematics 32 or 32L or 41 or an equivalent course (Advanced Placement allowed); Mathematics 103 and Mathematics 104 or equivalent courses. (Many upper-level mathematics courses assume programming experience at the level of Computer Science 4. Students without computer experience are encouraged to take Computer Science 6.)

**Major Requirements.** Eight courses in mathematics numbered above 111 including: Mathematics 121 or 200; Mathematics 139 or 203; and one of Mathematics 136, 181, 201, 204, 205, 206. Also, Physics 41L, 42L or Physics 51L, 52L or Physics 53L, 54L.

### Graduation with Distinction

The department offers a program for graduation with distinction in mathematics. See the *Handbook for Mathematics Majors and Minors* and also the section on honors in this bulletin.

### THE MINOR

**Prerequisite.** Mathematics 103 or equivalent.

**Requirements.** Five courses as follows: either Mathematics 104 or 111, but not both; four additional courses in mathematics numbered above 111, to include at least one course (or its equivalent) from the following: Mathematics 121, 132S, 135, 139, 160, 181, 187, or any 200-level course.

## Medicine (School)—Graduate (School) Basic Science Courses Open to Undergraduates

Qualified students in arts and sciences may select courses from the following offered by the graduate departments associated with the School of Medicine. A major is not offered to undergraduates in any of the departments listed below; nor do the courses count toward area of knowledge requirements. For permission to register for these courses and for further information, see Professors Fierke (biochemistry), Padilla (cell biology), Dawson (immunology), Pickup (microbiology), W. C. Hall (neurobiology), Hale (pathology), or Schwartz-Bloom (pharmacology and cancer biology). The 200-level courses below are described in the *Bulletin of Duke University: Graduate School*.

### BIOCHEMISTRY (BCH)

209, 210. Independent Study. One course each. *Staff*

222. Structure of Biological Macromolecules. Half course. *Richardson*

227. Introductory Biochemistry I: Intermediary Metabolism. Prerequisite: two semesters of organic chemistry. One course. *Hill and staff*

228. Introductory Biochemistry II. Prerequisites: organic chemistry and Biochemistry 227. One course. *Webster and staff*

259. Molecular Biology I: Proteins and Enzymes. Prerequisites: biochemistry, organic chemistry, and physical chemistry. C-L: Cell Biology 259, Immunology 259, and Microbiology 259. One course. *Richardson and staff*

265S, 266S. Seminar. Variable credit. *Staff*

268. Nucleic Acids. Prerequisites: introductory biochemistry and equivalents of Biochemistry 259 and Cell and Molecular Biology 247, 277, and 278. C-L: Cell Biology 268, Immunology 268, Microbiology 268, and University Program in Genetics 268. One course. *Steege and staff*

291. Physical Biochemistry. Prerequisites: undergraduate physical chemistry and one year of calculus. One course. *Oas and staff*

### CELL BIOLOGY (CBI)

All courses require the consent of the director of undergraduate studies.

203. Introduction to Physiology. Prerequisite: elementary biology. One course. *Blum and staff*

204. Cell and Molecular Physiology. Prerequisite: Cell Biology 203 or cell biology. One course. *Mandel, Wright, and staff*

211. Cellular Mechanisms of Injury. One course. *Fridovich, LeFurgey, Mandel, Steenbergen, and guest faculty*

212. Topics in Reproductive Biology. Prerequisite: Cell Biology 269 or equivalent. One course. *N. Anderson, Saling, Schomberg, or Tyrey*

219. Molecular and Cellular Bases of Differentiation. C-L: Immunology 219, Neurobiology 219, and Pathology 219. One course. *Staff*

259. Molecular Biology I: Proteins and Enzymes. Prerequisites: biochemistry, organic chemistry, and physical chemistry. See C-L: Biochemistry 259; also C-L: Immunology 259, and Microbiology 259. One course. *Richardson and staff*

268. Nucleic Acids. Prerequisites: introductory biochemistry and equivalents of Biochemistry 259 and Cell and Molecular Biology 247, 277, and 278. See C-L: Biochemistry 268; also C-L: Immunology 268, Microbiology 268, and University Program in Genetics 268. One course. *Steege and staff*

#### Courses Currently Unscheduled

205. Design and Analysis of Biological Experiments

213. Oxygen and Physiological Function

215. Seminar in the Physiology of Disease

217. Selected Membrane Transport

223. Cellular and Integrative Cardiovascular Physiology and Biophysics

232. Extracellular Matrix and Cell Adhesion

237. Analytical Imaging in Biomedical Research

269. Advanced Cell Biology

#### IMMUNOLOGY (IMM)

209, 210. Independent Study. One course each. *Staff*

219. Molecular and Cellular Bases of Differentiation. See C-L: Cell Biology 219; also C-L: Neurobiology 219, and Pathology 219. One course. *Staff*

244. Principles of Immunology. Prerequisites: Biology 119 and Chemistry 151L or equivalents. C-L: Biology 244 and Zoology 244. One course. *Kostyu, McClay, and staff*

252. General Virology and Viral Oncology. See C-L: Microbiology 252. One course. *Keene and staff*

259. Molecular Biology I: Proteins and Enzymes. Prerequisites: biochemistry, organic chemistry, and physical chemistry. See C-L: Biochemistry 259; also C-L: Cell Biology 259, and Microbiology 259. One course. *Richardson and staff*

268. Nucleic Acids. Prerequisites: introductory biochemistry and equivalents of Biochemistry 259 and Cell and Molecular Biology 247, 277, and 278. See C-L: Biochemistry 268; also C-L: Cell Biology 268, Microbiology 268, and University Program in Genetics 268. One course. *Steege and staff*

#### MICROBIOLOGY (MIC)

209, 210. Independent Study. One course each. *Staff*

221. Medical Microbiology. One course. *Mitchell and staff*

252. General Virology and Viral Oncology. C-L: Immunology 252. One course. *Keene and staff*

259. Molecular Biology I: Proteins and Enzymes. Prerequisites: biochemistry, organic chemistry, and physical chemistry. See C-L: Biochemistry 259; also C-L: Cell Biology 259, and Immunology 259. One course. *Richardson and staff*

268. Nucleic Acids. Prerequisites: introductory biochemistry and equivalents of Biochemistry 259 and Cell and Molecular Biology 247, 277, and 278. See C-L: Biochemistry 268; also C-L: Cell Biology 268, Immunology 268, and University Program in Genetics 268. One course. *Steege and staff*

282. Microbial Pathogenesis. One course. *Hanna and staff*

#### Courses Currently Unscheduled

214. Fundamentals of Electron Microscopy

#### NEUROBIOLOGY (NBI)

49S. First-Year (Undergraduate) Seminar. One course. *Staff*

93S. The Neurobiology of Mind. One course. *Einstein*

133. Fundamental Issues in the Study of the Brain. See C-L: Psychology 133. One course. *W. C. Hall*

154. Principles of Neurobiology. Prerequisites: Biology 25L, and Chemistry 12L or equivalent. See C-L: Biology 154; also C-L: Neurosciences, and Psychology 135. One course. *LaMantia or Nowicki*

195S, 196S. Special Topics in Neurobiology. One course each. *Staff*

219. Molecular and Cellular Bases of Differentiation. See C-L: Cell Biology 219; also C-L: Immunology 219, and Pathology 219. One course. *Staff*



## **PATHOLOGY (PTH)**

- 209, 210. Independent study. Prerequisites: senior standing. One course each. *Staff*
219. Molecular and Cellular Bases of Differentiation. See C-L: Cell Biology 219; also C-L: Immunology 219, and Neurobiology 219. One course. *Staff*
225. Introduction to Systemic Histology. Half course. *Hale and staff*
258. Cellular and Subcellular Pathology. Half course. *Lefurgey, Roggli, and Shelburne*
275. Fundamentals of Electron Microscopy and Biological Microanalysis. One course. *Ingram, Lefurgey, Roggli, and Shelburne*

## **PHARMACOLOGY AND CANCER BIOLOGY (PHR)**

150. Pharmacology: Drug Actions and Reactions. Prerequisites: introductory biology (Biology 25L) and chemistry (Chemistry 11L, 12L). One course. *Schwartz-Bloom*
160. Drugs, Brain, and Behavior. Prerequisites: introductory biology (Biology 25L) and chemistry (Chemistry 11L, 12L). C-L: Psychology 127. One course. *Kuhn*
- 191, 192. Independent Study. One course each. *Staff*
233. Essentials of Pharmacology and Toxicology. Prerequisites: introductory biology; Chemistry 151L; Mathematics 31 and 32. One course. *Slotkin and staff*
254. Mammalian Toxicology. Prerequisites: introductory biology, and Chemistry 151L, or consent of instructor. One course. *Abou-Donia and staff*

## **Medieval and Renaissance Studies (MED)**

Professor Aers, *Chair*; Associate Professor Bland, *Director of Undergraduate Studies*

A major or minor is available in this program.

The program in Medieval and Renaissance Studies is designed to provide the student with a well-rounded understanding of the historical, cultural, and social forces that shaped the medieval and Renaissance periods. The program is divided into four areas of study: fine arts (art and music); history; language and literature (English, French, German, Greek, Italian, Latin, and Spanish); and philosophy/religion. An interdisciplinary major is offered. See the section on the major below.

### **MEDIEVAL AND RENAISSANCE COURSES**

**21S. First-Year Seminar: Topics in Medieval Studies.** Topics vary according to instructor: perspectives from history, literature, religion, philosophy, and the arts. One course. *Staff*

**22S. First-Year Seminar: Topics in Renaissance Studies.** Topics vary according to instructor: perspectives from history, literature, religion, philosophy, and the arts. One course. *Staff*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**114. Aspects of Medieval Culture. (CZ)** A study of historical, literary, philosophical, and art historical materials introducing medieval culture and the methods developed for its study. C-L: Art History 139, Classical Studies 139, and History 116. One course. *Rasmussen, Solterer, or Witt*

**115. Aspects of Renaissance Culture. (AL, CZ)** A study of historical, literary, philosophical, and art historical materials introducing Renaissance culture and the methods developed for its study. C-L: Art History 149, History 148, and Italian 125. One course. *Finucci, Rasmussen, Rice, Van Miegroet, and Witt*

**160S. Topics in Medieval and Renaissance Studies.** Interdisciplinary perspectives from the arts, history, literature, philosophy, and religion. For juniors and seniors and medieval and Renaissance studies majors, or with consent of instructor. Prerequisites: one course in medieval and/or Renaissance periods. One course. *Staff*

**200S. Seminar in Medieval and Renaissance Studies. (CZ)** Topics in the historiography and interpretation of medieval and Renaissance culture. Topics will vary from year to year. One course. *Staff*

**OTHER COURSES AVAILABLE IN THE PROGRAM AND DESCRIBED UNDER THE LISTINGS OF THE DEPARTMENTS SPECIFIED BELOW**

**Art History**

- 129. The History of Prints and Printmaking. *Rice*
- 134. Topics in Medieval Art and Architecture. *Staff*
- 139. Aspects of Medieval Culture. (Cross-listed.) *Rasmussen, Solterer, or Witt*
- 140. Topics in Renaissance Art. *Rice*
- 141. Fifteenth-Century Italian Art. *Rice*
- 142. Sixteenth-Century Italian Art. *Rice*
- 143. The Art of the Counter Reformation. *Rice*
- 145. Renaissance Art in Florence. *Staff*
- 146. Italian Renaissance Architecture. *Rice*
- 148. Art of the Netherlands in the Fifteenth Century. *Van Miegroet*
- 149. Aspects of Renaissance Culture. (Cross-listed.) *Finucci, Rasmussen, Rice, Van Miegroet, and Witt*
- 150. Italian Baroque Architecture. *Rice*
- 152. Art of the Netherlands in the Sixteenth Century. (Cross-listed.) *Van Miegroet*
- 153. Art of the Northern Netherlands in the Seventeenth Century. (Cross-listed.) *Van Miegroet*
- 154. German Art in the Fifteenth and Sixteenth Centuries. (Cross-listed.) *Van Miegroet*
- 236S. Topics in Romanesque and Gothic Art and Architecture. *Bruzeliuss*
- 243S. Topics in Netherlandish and German Art. (Cross-listed.) *Van Miegroet*
- 247S. Topics in Italian Renaissance Art. *Rice*
- 260S. Topics in Italian Baroque Art. *Rice*

**Classical Studies**

- 116S. The Pagan World of the Divine Comedy. (Cross-listed.) *Clay*
- 117. Ancient Myth in Literature. *Davis or Newton*
- 139. Aspects of Medieval Culture. (Cross-listed.) *Rasmussen, Solterer, or Witt*

**Cultural Anthropology**

- 147, 148. Introduction to Islamic Civilization. (Cross-listed.) *Cornell, Lawrence, and staff*

**Distinguished Professor Courses**

- 190S. The Pagan World of the Divine Comedy. (Cross-listed.) *Clay*

**Drama**

- 171. French Drama of the Seventeenth Century. (Cross-listed.) *Longino*
- 182, 183. Shakespeare. (Cross-listed.) *DeNeef, Goldberg, Gopen, Jones, Porter, Randall, or Shannon*

**English**

- 121A. Medieval English Literature to 1500. *Aers*
- 121B. Sixteenth-Century English Literature. *DeNeef, Fish, Randall, or Shannon*
- 123A. English Literature: 1600 to 1660. *DeNeef, Fish, Goldberg, or Randall*
- 140, 141. Chaucer. *Aers, Beckwith, DeNeef, or Gopen*
- 143, 144. Shakespeare. (Cross-listed.) *DeNeef, Goldberg, Gopen, Jones, Porter, Randall, or Shannon*
- 145. Milton. *Fish, Goldberg, or Price*
- 208. History of the English Language. (Cross-listed.) *Butters or Tetel*
- 212. Middle English Literature: 1100 to 1500. *Aers or Beckwith*
- 213, 214. Chaucer. *Aers or Beckwith*
- 221. Renaissance Prose and Poetry: 1500 to 1660. *DeNeef, Fish, Goldberg, Randall, or Shannon*

**French**

- 140. France in the Making: Language, Nation, and Literary Culture in Premodern Europe. *Solterer*
- 144. Medieval Fictions. *Solterer*
- 145S. Topics in Renaissance Literature and Culture. (Cross-listed.) *Tetel*
- 146S. Montaigne and Self-Portraiture. *Tetel*
- 148. French Drama of the Seventeenth Century. (Cross-listed.) *Longino*
- 211. History of the French Language. (Cross-listed.) *Thomas*
- 240. Medieval Narrative. *Solterer*

**German**

- 164S. Medieval German Literature. *Rasmussen*
- 165S. The Vikings and their Literature. *Keul*

201. Introduction to Medieval German: The Language of the German Middle Ages and Its Literature. *Rasmussen*  
 203S. Sex, Gender, and Love in Medieval German Literature. *Rasmussen*  
 215S. German Baroque Literature. *Borchardt*  
 260. History of the German Language. (Cross-listed.) *Rasmussen*

### History

56. Medieval Cities: Walls, Wealth, and Welfare. *Green*  
 57. Poverty and Sanctity in Medieval Society. *Peyroux*  
 101G, 102G. Introduction to Islamic Civilization. (Cross-listed.) *Cornell, Lawrence, and staff*  
 107A. Tudor/Stuart Britain. (Cross-listed.) *Herrup*  
 107B. Modern Britain. (Cross-listed.) *Thorne*  
 116. Aspects of Medieval Culture. (Cross-listed.) *Rasmussen, Solterer, or Witt*  
 117. Early Modern Europe. (Cross-listed.) *Neuschel*  
 133A. The Birth of Europe: Society and Culture, 200-900. *Peyroux*  
 133C. British Isles in the Middle Ages. *Peyroux*  
 134A. History of Jews in the Early Middle Ages. (Cross-listed.) *Shatzmiller*  
 134B. History of Jews in the Late Middle Ages. *Shatzmiller*  
 138. Renaissance and Reformation Germany. (Cross-listed.) *Robisheaux*  
 148. Aspects of Renaissance Culture. (Cross-listed.) *Finucci, Rasmussen, Rice, Van Miegroet, and Witt*  
 151A. The Intellectual Life of Europe, 1250-1600. (Cross-listed.) *Witt*  
 156A. The Reformation of the Sixteenth Century. (Cross-listed.) *Hillerbrand*  
 221. Special Topics in the History of Europe, 1200-1700. (Cross-listed.) *Neuschel or Robisheaux*  
 222A. Problems in the Intellectual History of the European Renaissance and Reformation. *Witt*  
 222B. Florence: Renaissance City. *Witt*  
 236A. Topics in the History of Monasticism. *Peyroux*  
 238S. Europe in the High Middle Ages. *Shatzmiller*  
 251A. Topics in Intellectual History of Europe, 1250-1450. *Witt*  
 251B. Topics in Intellectual History of Europe, 1450-1650. (Cross-listed.) *Witt*  
 268S. England in the Seventeenth Century. (Cross-listed.) *Herrup*

### Italian

- 111, 112. Introduction to Italian Literature. *Caserta or Finucci*  
 123. Aspects of Italian Literature. (Cross-listed.) *Finucci*  
 125. Aspects of Renaissance Culture. (Cross-listed.) *Finucci, Rasmussen, Rice, Van Miegroet, and Witt*  
 145S. Topics in Renaissance Literature and Culture. *Finucci*  
 284, 285. Dante. *Caserta*

### Latin

221. Medieval Latin. *Newton*

### Music

- 155S. Music History I: To 1650. *Brothers*  
 211, 212. Notation. *Brothers or Silbiger*  
 223. Music in the Renaissance. *Brothers or Silbiger*

### Philosophy

119. Medieval Philosophy. *Mahoney*  
 120. Late Medieval and Renaissance Philosophy. *Mahoney*  
 218S. Medieval Philosophy. *Mahoney*  
 219S. Late Medieval and Renaissance Philosophy. *Mahoney*

### Religion

134. Jewish Mysticism. (Cross-listed.) *Bland*  
 135. Jewish Religious Thought. (Cross-listed.) *Bland*  
 146, 147. Introduction to Islamic Civilization. (Cross-listed.) *Cornell, Lawrence, and staff*  
 158. The Reformation of the Sixteenth Century. (Cross-listed.) *Hillerbrand*

### Spanish

151. Spanish Literature of the Renaissance and the Baroque. *Greer*  
 153. Golden Age Literature: Cervantes. *Greer*  
 210. History of the Spanish Language. (Cross-listed.) *Garci-Gómez*

## THE MAJOR

The major requires ten courses, at least eight of which must be at the 100 level or above in the following four areas of study: history; fine arts (art and music); language and literature (English, French, German, Greek, Italian, Latin, and Spanish); and philosophy-religion.

Two courses may be at the introductory level approved by the director of undergraduate studies. Students presenting two courses in the Medieval and Renaissance FOCUS program do not need approval.

Each program is tailored to the needs and interests of the student under the supervision of a committee consisting of faculty members from appropriate departments. After discussion with the director of undergraduate studies for Medieval and Renaissance Studies, the student submits a provisional program of study outlining special interdisciplinary interests. Normally, the program is planned well before the end of the sophomore year to allow time to acquire a working knowledge of languages pertinent to specific interests.

## THE MINOR

*Requirements.* Five courses, at least three of which must be at the 100 level or above; courses must include two courses in areas outside the major area of interest or three courses in the major area of interest and Medieval and Renaissance Studies 114 and 115.

## Military Science—Army ROTC (MSC)

Visiting Professor Adams, Lieutenant Colonel, U.S. Army, *Chair and Supervisor of Senior Instruction*; Visiting Assistant Professor Padgett, Captain, U.S. Army Reserve, *Director of Undergraduate Studies, Supervisor of Sophomore Instruction, and Commandant of Cadets*; Visiting Assistant Professor Figliuolo, Captain, U.S. Army, *Supervisor of Freshman Instruction and Recruiting Officer*; Visiting Assistant Professor Sutter, Captain, U.S. Army, *Supervisor of Junior Instruction*

The Department of Military Science offers students from all disciplines within the university the opportunity to study the following subjects: leadership (theory and practice), management (time, personnel, and material), ethics and the military profession, the role and responsibility of the military in a democratic society, the philosophy and practice of military law, strategy, and tactics.

The Army ROTC program is made up of a two-year basic course of study (freshman and sophomore level) which is taken without obligation by nonscholarship students, and a two-year advanced course of study (junior and senior level) which includes a five-week advanced camp, usually completed during the summer prior to the senior year. Direct entry into the advanced course is sometimes permitted if an applicant has previous military training or experience, or when a six-week basic camp is completed. To be eligible for participation in the advanced course, students must successfully complete the basic course (unless direct entry is permitted), be physically qualified, be of good moral character, have a minimum of two years remaining as a student (undergraduate or graduate level or a combination), and sign a contract to accept a commission in the United States Army, the Army National Guard, or the Army Reserve as directed by the Secretary of the Army.

Laboratory is mandatory each semester for scholarship cadets and nonscholarship cadets. Some specific laboratories are required for non-ROTC students taking Military Science 11, 12, 51, and 52. Students should consult the Department of Military Science (telephone 1-919-660-3090 collect, or 1-800-222-9814, toll free) for more detailed information. Also see the Army Reserve Officers' Training Corps section under Special Programs in this bulletin.

**1L. Leadership Laboratory.** (Fall semester only.) Drill and ceremonies, marksmanship training, land navigation exercises, first aid, small unit tactics, and confidence training. Must be repeated with each fall semester course. *Padgett*

**2L. Leadership Laboratory.** (Spring semester only.) Drill and ceremonies, communications, and tactical exercises. Must be repeated with each spring semester course. *Padgett*



**11S. Leadership and Ethics in the Army Today.** The military organization with emphasis on tradition, doctrine, and contribution to national objectives. Laboratory required for ROTC cadets. Half course. *Figliuolo*

**12S. The Military Profession.** Introduction to the concept of the military as a profession. Questions of ethics and values in the military; the issue of war and morality. Laboratory required for ROTC cadets. Half course. *Figliuolo*

**51. Military Topography.** Interpretation and use of topographical maps to facilitate land navigation. Consideration of the military significance of terrain. Laboratory required for Army ROTC cadets. Half course. *Padgett*

**52. Introduction to Small Unit Tactics.** Introduction to planning, organizing, and conducting small unit offensive and defensive operations. Consideration of the principles of war. Laboratory required for Army ROTC cadets. Half course. *Padgett*

**113. Advanced Military Operations.** Fundamentals of the conduct of military operations including advanced military topography; unit movements; route planning; nuclear, biological, and chemical defense; and military communications. Laboratory required for Army ROTC cadets. Prerequisites: Military Science 51 and 52 or ROTC Basic Camp. One course. *Sutter*

**114. Advanced Tactical Applications.** Study of threat forces to include doctrine, organization, equipment, and training. Conduct of platoon offensive, defensive, and patrolling operations for Army infantry units. Laboratory required for Army ROTC cadets. Prerequisite: Military Science 113. One course. *Sutter*

**151S. Military Justice and Law of War.** Introduction to the Uniform Code of Military Justice, selected topics in military law, the law of land warfare, and war and morality. An analysis of the relationship of leadership to these topics. Laboratory required for Army ROTC cadets. One course. *Adams*

**152. Leadership and Command Management.** Theory and practice of leadership and military management techniques for mission accomplishment. Laboratory required for Army ROTC cadets. One course. *Adams*

**191. Independent Study.** Directed readings and research in military science. One course. *Padgett*

## Music (MUS)

Professor Todd, *Chair*; Assistant Professor of the Practice Bagg, *Director of Undergraduate Studies*; Professor of the Practice Parkins, *Director of Performance*; Professor Silbiger; Associate Professors Bartlet, Gilliam, Jaffe, and Lindroth; Assistant Professors Brothers, Meintjes, and Moreno; Professors Emeriti Bryan, Douglass, Hanks, Williams; Associate Professor Emeritus Saville; Assistant Professor Emeritus Henry; Professor of the Practice Jeffrey; Associate Professors of the Practice Dunn, Pritchard, Raimi, Votta, and Wynkoop; Assistant Professors of the Practice Ku, Love, Muti, and Troxler; Adjunct Assistant Professor Druessedow; Adjunct Associate Professor of the Practice Jensen; Staff Associates Crawford, Dimsdale, Eagle, Gilmore, Greenberg, Hanks, Hawkins, Kris, Lail, Lile, Liv, Pederson, Reed, Schultz, and Tektonidis

A major or a minor is available in this department.

For over two thousand years, music has been viewed as a crucial part of education, compulsory in some cultures, optional in many others. Music is customarily regarded as an art, but as a university subject it has its own logic and grammar, in the understanding of

which the mind is stretched and tested. Furthermore, music as taught at Duke includes assumptions that history, theory, composition, and performance are areas of comparable worth both in themselves and as a means of understanding the many facets of musicianship. Almost every student has some personal involvement with music (often with the many kinds of music), and the courses aim to further that involvement, whether a simple hobby or a compelling interest.

Courses include many kinds of instruction: applied lessons, history, theory and ethnomusicology lectures and seminars, composition classes, ensemble participation, practical laboratory work (such as ear-training), coaching sessions for conductors and chamber musicians, and jazz improvisation. Emphasis is placed equally on theory and practice, and students' musical activity can vary widely across the spectrum, from composing their own music to endeavoring to understand the technical, historical, and sociological context of the music of others.

Musical studies can have a particular value in Program II. So many areas of interest in literature, the arts, art history, anthropology, sociology, politics, philosophy, religion, psychology, and physics are illustrated, paralleled, or elucidated by aspects of music, just as music itself is by those other disciplines.

## **THEORY, COMPOSITION, AND CONDUCTING**

The department's theory courses are designed to give the student a deeper understanding of musical materials: harmony, counterpoint, voice leading, and musicianship. This is accomplished through analysis of repertoire, composition, aural work, and keyboard playing (score reading, figured bass, and simple improvisation).

**36. Acoustics and Music. (NS)** No previous knowledge of physics is assumed. See C-L: Physics 36. One course. *Lawson*

**55. Introduction to Music Theory. (AL)** Fundamentals of notation, melodic and harmonic practice, analysis, and score reading, as a basis for independent work. Prerequisite: some ability to read music. One course. *Love, Troxler, or staff*

**56. The Songwriter's Vocabulary. (AL)** Writing songs in various twentieth-century popular styles. Fundamentals of form, harmony, voice leading, text setting, and production. Prerequisite: Music 55 or consent of instructor. One course. *Staff*

**65. Fundamentals of Music Theory. (AL)** Physical properties of sound, principles of diatonic tonal organization, melodic and harmonic constructions, elementary counterpoint, and figured bass. Laboratory. Prerequisites: basic knowledge of musical notation and vocabulary. One course. *Lindroth, Moreno, or Parkins*

**66. Tonal Harmony. (AL)** Harmonic language of eighteenth and nineteenth centuries, functional chromaticism, and introduction to musical forms. Laboratory. Prerequisite: Music 65. One course. *Lindroth or Moreno*

**75. Jazz Improvisation I. (AL)** The theory of jazz improvisation and its practical application to the different styles of jazz. Consent of instructor required. Half course. *Crawford or Jeffrey*

**76. Jazz Improvisation II. (AL)** See Jazz Improvisation I. Prerequisite: Music 75 or consent of instructor. Half course. *Crawford or Jeffrey*

**116S. Counterpoint. (AL)** Polyphonic practice from the sixteenth through the twentieth centuries; sacred and secular music. Laboratory. Prerequisite: Music 66 or consent of instructor. One course. *Jaffe or Moreno*

**117S. Form, Analysis, and Compositional Techniques. (AL)** Analytical studies and compositional exercises in various forms, techniques, and styles with an emphasis on

nineteenth- and twentieth-century music. Laboratory. Prerequisite: Music 66 or consent of instructor. One course. *Jaffe, Lindroth, or Moreno*

**118S. Special Topics in Music Theory. (AL)** Topics vary. Prerequisite: Music 66 or consent of instructor. One course. *Jaffe, Lindroth, or Moreno*

**123. Musicianship I.** Development of practical musical skills: sight singing, ear training, and keyboard proficiency. Prerequisite: for music majors, Music 66; for nonmajors, consent of instructor. Half course. *Staff*

**124. Musicianship II.** Prerequisite: Music 123. Half course. *Staff*

**128. Instrumental Conducting. (AL)** Development of techniques of conducting instrumental ensembles with emphasis on orchestral repertoire. Score-reading and analysis, principles of interpretation, and practical conducting experience. Prerequisite: Music 66 or consent of instructor. One course. *Muti*

**129. Choral Conducting. (AL)** Development of techniques of conducting vocal repertoire, ranging from church anthems to large-scale works. Score-reading and analysis, principles of interpretation, and practical conducting experience. Prerequisite: Music 66 or consent of instructor. One course. *Wynkoop*

**151S. Composition I. (AL)** Composing original music in smaller forms for voice, piano, and other instruments. Studies in compositional techniques. Prerequisites: Music 65 and 66 or consent of instructor. One course. *Jaffe or Lindroth*

**152S. Composition II. (AL)** See Music 151S. Prerequisites: Music 65 and 66 or consent of instructor. One course. *Jaffe or Lindroth*

**153S. Electronic Music: Introduction to Digital Synthesis. (AL)** Composing electronic music with frequency modulation synthesis, MIDI sequencing, and digital recording and editing. History of electronic music. One course. *Lindroth*

## **HISTORY, LITERATURE, AND MUSICOLOGY**

The study of music history and literature contributes to a broader knowledge of culture and society. Courses offer students the opportunity to examine compositions in their historic and/or social context. In addition to surveying significant forms, genres, and styles, and their development, the courses include consideration of the place of music and musicians in social life, aspects of performance practice, and aesthetic value. Although the normal prerequisite for Music 155S-159S (Music History, I-III) is Music 65, interested students in other disciplines with some background in music are encouraged to ask individual instructors for permission to enroll.

**20S. Special Topics in Music.** Opportunities to engage with a specific issue in music, with emphasis on student writing. One course. *Staff*

**48S. Music in Contemporary America. (AL)** Major topics and trends in music, including the legacy of serialism, minimalism, electronic music, fusion, jazz, musical theater, and film music. Examination of works by leading composers; consideration of music's place in contemporary society as a performing art and entertainment. Open only to students in the FOCUS Program, The Arts in Contemporary Society. One course. *Gilliam or Jaffe*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**74. Introduction to Jazz. (AL)** A survey examining musical, aesthetic, sociological, and historical aspects. C-L: African and African-American Studies 74. One course. *Jeffrey*

**119. The Humanities and Music. (AL)** Study of music's relationship to the humanities (literature, art, philosophy, cultural and social history) through selected topics. Readings from primary sources, listening to representative pieces of music. C-L: Comparative Area Studies. One course. *Bartlet or staff*

**125. Masterworks of Music. (AL)** An introduction to the lives and works of major Western European and American composers. One course. *Muti, Silbiger, or Todd*

**125D. Masterworks of Music. (AL)** Same as Music 125 except instruction is provided in two lectures and one small discussion meeting each week. One course. *Gilliam or staff*

**136. Music of the World's Peoples. (CZ)** Study of musical styles and practices in relation to issues of creativity, forms of power and cultural survival; focus on the music and experiences of indigenous peoples, migrants, and immigrants. C-L: Comparative Area Studies. One course. *Meintjes*

**137. Music, Social Life, and Scenes. (CZ)** Study of musical styles and performance practices in relation to issues of identity and other aspects of social life; focus on the diverse local musical scenes and traditions and on learning through doing original fieldwork. One course. *Meintjes*

**138S. Special Topics in Ethnomusicology. (AL, CZ)** Topics to be announced addressing a range of musical traditions from around the world. One course. *Meintjes or staff*

**141S. Special Topics in Jazz. (AL)** Topics vary. Also taught as African and African-American Studies 141S. Prerequisite: Music 74 or consent of instructor. One course. *Brothers or Jeffrey*

**142. African-American Music in the Twentieth Century. (AL)** A survey including ragtime, blues, jazz, religious music, and the concert tradition. Cultural and social contexts such as commercial influences, race relations, and the Great Migration. C-L: African and African-American Studies 142. One course. *Brothers*

**143. Beethoven and His Time. (AL)** The music of Beethoven and its relation to contemporary historical, social, and literary developments. Emphasis on the nine symphonies. C-L: Comparative Area Studies. One course. *Bartlet, Gilliam, Silbiger, or Todd*

**144. Bach and His Time. (AL)** The music of Johann Sebastian Bach and its historical and cultural background, with emphasis on the sacred and the instrumental works. Some consideration also given to the music of Bach's contemporaries, including Vivaldi, Rameau, and Handel. C-L: Comparative Area Studies. One course. *Silbiger*

**145. Mozart and His Time. (AL)** A biographical sketch and a study of his works in their relationship to the past and to works of contemporaries in various European countries. C-L: Comparative Area Studies. One course. *Silbiger*

**146. Nineteenth-Century German Romanticism in Music. (AL)** The principal nineteenth-century figures, including Beethoven, Schubert, the Mendelssohns and Schumanns, Liszt, Wagner, and Brahms. Their eighteenth-century antecedents (C. P. E. Bach, Haydn, Mozart). One course. *Todd*

**147. Verdi and Italian Romantic Opera. (AL)** The operas of Giuseppe Verdi, from early works closely connected with the Risorgimento to later masterworks like *Otello*, considered in relation to his Italian predecessors and contemporaries. Includes the study of musical scores, dramatic aspects, and literary background, as well as artistic and social conventions. One course. *Muti*

**155S. Music History I: To 1650. (AL)** The history of music in medieval and early modern Europe in its cultural and social context. Prerequisite: Music 65 or consent of instructor. C-L: Medieval and Renaissance Studies. One course. *Brothers*



**158S. Music History III: After 1850. (AL)** The history of music in Europe and the United States in its cultural and social context. Prerequisite: Music 65 or consent of instructor. C-L: Comparative Area Studies. One course. *Gilliam or Todd*

**159S. Music History II: From 1650 to 1850. (AL)** The history of music in Europe in its cultural and social context. Not open to students who have had Music 156S or Music 157S. Prerequisite: Music 65 or consent of instructor. C-L: Comparative Area Studies. One course. *Bartlet or Silbiger*

**164. The Musical. (AL)** See C-L: Drama 111. One course. *Clum*

**165. Opera in Vienna. (AL)** Focus on the composers, music, historical context, and texts of the operas being performed at the Staatsoper and Volksoper. Analysis of critical reviews. Attendance at one opera per week required. Offered as part of the Duke in Vienna Program. One course. *Moore*

**166. Opera. (AL)** History of opera from the late sixteenth century to the present. Relationship of music and text; opera as social commentary; changing forms and styles. Selected composers, especially Mozart, Verdi, Puccini, and Wagner. One course. *Bartlet or Muti*

**167. Symphonic Literature. (AL)** An investigation of the symphony, tone poem, and symphonic suite from seventeenth-century antecedents to the orchestral repertoire of the present century. One course. *Staff*

**168. Piano Music. (AL)** The two-hundred-year tradition of music for the piano, the evolution of the instrument, and its principal composers (including Mozart, Beethoven, Chopin, Liszt, Brahms, and other major figures up to the present day). Performance traditions, the role of virtuosity, and improvisation. One course. *Todd*

**169. Hollywood Film Music. (AL)** Film scores from the 1930s to the present. Technical, structural, and aesthetic issues, as well as the problem of musical style. C-L: Film and Video. One course. *Gilliam*

**185S, 186S. Seminar in Music. (AL)** Primarily for junior and senior music majors. Topics to be announced. Consent of instructor required. One course each. *Staff*

**187S, 188S. Seminar on Interpretation and Performance. (AL)** Interpretative analysis of instrumental (piano, strings, winds) and vocal repertoire from baroque to modern composers. Participants expected to perform. Consent of instructor required. One course each. *Dunn, Troxler, or staff*

**189S, 190S. Seminar in Music History. (AL)** Primarily for junior and senior music majors. Topics to be announced. Prerequisites: Music 155S, 158S, and 159S. One course each. *Staff*

### **For Advanced Undergraduates and Graduates**

**201. Introduction to Musicology. (AL)** Methods of research on music and its history, including studies of musical and literary sources, iconography, performance practice, ethnomusicology, and historical analysis, with special attention to the interrelationships of these approaches. One course. *Bartlet or Druesedow*

**203. Proseminar in Performance Practice. (AL)** Critical methods in the study of historical performance practice, including the evaluation of evidence provided by musical and theoretical sources, archival and iconographic materials, instruments, and sound recordings. Current issues regarding the performance practice for music from the Middle Ages to the twentieth century. One course. *Silbiger*

**211, 212. Notation. (AL)** Development and changing function of musical notation from c. 900 to c. 1900, including plainchant notations, black notations, white notations, the invention of printing (particularly movable type and engraving), keyboard and lute tablatures, scores. C-L: Medieval and Renaissance Studies. One course each. *Brothers or Silbiger*

**213. Theories and Notation of Contemporary Music. (AL)** The diverse languages of contemporary music and their roots in the early twentieth century, with emphasis on the problems and continuity of musical language. Recent composers and their stylistic progenitors: for example, Ligeti, Bartók, and Berg; Carter, Schoenberg, Ives, and Copland; Crumb, Messiaen, and Webern; Cage, Varèse, Cowell, and Stockhausen. One course. *Jaffe or Lindroth*

**215. Music Analysis. (AL)** Historical, philosophical, and ideological issues raised by music analysis. Intensive study of harmony and voice leading in the works of major tonal composers, with emphasis on the analytic approach of Heinrich Schenker. One course. *Moreno or Todd*

**217. Selected Topics in Analysis. (AL)** An exploration of analytical approaches appropriate to a diversity of music, which may include settings of literary texts, pre-tonal music, and music in oral and vernacular traditions. Prerequisite: Music 215 or consent of instructor. One course. *Moreno or Silbiger*

**223. Music in the Renaissance. (AL)** Selected topics. C-L: Medieval and Renaissance Studies. One course. *Brothers or Silbiger*

**224. Music in the Baroque Era. (AL)** Selected topics. One course. *Silbiger*

**225. Music in Classic Era. (AL)** Selected topics. Once course. *Bartlet or Todd*

**226. Music in the Nineteenth Century. (AL)** Selected topics. One course. *Bartlet, Gilliam, or Todd*

**227. Music in the Twentieth Century. (AL)** Selected topics. One course. *Gilliam or Todd*

**295S. Composition Seminar. (AL)** Selected topics in composition. One course. *Jaffe or Lindroth*

**296S. Analysis of Contemporary Music. (AL)** Structures, expressive intentions, and functions since 1914. Contemporary orchestral music, American music, European music, popular media, musical tradition, and contemporary composers. Analysis of works performed in the department's Encounters Series with occasional guest composers present. One course. *Jaffe or Lindroth*

**297, 298, 299. Composition. (AL)** Weekly independent study sessions at an advanced level with a member of the graduate faculty in composition. One course each. *Jaffe or Lindroth*

## INDEPENDENT STUDY

Admission to these courses will be subject to the approval of the director of undergraduate studies and the instructor. The instructor and course content will be established in accordance with the individual student's interests and capacities.

**177, 178. Independent Study in Conducting.** Advanced work in reading scores, analysis, principles of interpretation, and practical conducting experience. Prerequisite: Music 128 or 129 or consent of instructor. One course each. *Muti or Wynkoop*

**179, 180. Independent Study in Musical Performance.\*** Open only to sophomores possessing an exceptional technical and interpretative command of a musical medium. Requires either a half-length recital at the end of each semester of study or a full-length recital

at the end of the second semester. In the latter case, a brief performance before a jury of music department faculty is required at the end of the first semester. Prerequisites: previous registration in private instruction in applied music at Duke, audition, and consent of instructor. One course each. *Staff*

**181, 182. Independent Study in Musical Performance.\*** Same as 179, 180, but for juniors. One course each. *Staff*

**183, 184. Independent Study in Musical Performance.\*** Same as 179, 180, but for seniors. One course each. *Staff*

**191, 192. Independent Study.** Directed reading, research, and/or theoretical analysis, culminating in a substantial paper; or exploration of advanced compositional techniques resulting in a work of larger scale. For juniors only. One course each. *Staff*

**193, 194. Independent Study.** Same as 191, 192, but for seniors. One course each. *Staff*

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\*The schedule of fees for private lessons is applicable to courses 179, 180, 181, 182, 183, 184 (see subsection on fees).

## APPLIED MUSIC

The study of performance is an active way of understanding music literature, facing questions of style, and honing one's technical and expressive skills. Provided they qualify by audition, students are encouraged to enroll in private instruction and to participate in ensembles. Auditions must be arranged with the instructor prior to registration. Enrollment in an applied music course does not guarantee permission to enroll in the instructor's class or ensemble the following semester; in some cases another audition may be required. For those students who wish to study privately but do not qualify for university-level instruction, a list of music teachers in the immediate area who are available to Duke students can be obtained from the department office. All applied music courses may be repeated for credit, but no more than two ensembles may be taken concurrently.

**57S, 58S. Vocal Diction.** 57S: Italian/English; 58S: German/French. For singers, actors, radio announcers, and public speakers. Introduction to the international phonetic alphabet. Students will be required to sing in class. Written, oral, and vocal performance examinations. Half course each. *Lail*

**Instruction: half hour**

- 79. Class Applied Music. Quarter course. *Greenberg, Lail, Reed, or staff*
- 80. Piano. Quarter course. *Crawford, Hawkins, Liv, Love, or staff*
- 81. Strings. Quarter course. *Bagg, Ku, Pritchard, or Raimi*
- 82. Woodwinds. Quarter course. *Gilmore, Jeffrey, Pederson, Schultz, or Troxler*
- 83. Brass. Quarter course. *Dimsdale, Eagle, or Kris*
- 84. Percussion. Quarter course. *Hanks*
- 85. Voice. Quarter course. *Dunn, Jensen, Lail, or Tektonidis*
- 86. Organ. Quarter course. *Parkins*
- 87. Harpsichord. Quarter course. *Parkins*
- 88. Guitar. Quarter course. *Lile or Reed*

**Instruction: 1 hour**

- 90. Piano. Half course. *Crawford, Hawkins, or Love*
- 91. Strings. Half course. *Bagg, Ku, Pritchard, or Raimi*
- 92. Woodwinds. Half course. *Gilmore, Jeffrey, Pederson, Schultz, or Troxler*
- 93. Brass. Half course. *Dimsdale, Eagle, or Kris*
- 94. Percussion. Half course. *Hanks*
- 95. Voice. Half course. *Dunn, Jensen, Lail, or Tektonidis*
- 96. Organ. Half course. *Parkins*
- 97. Harpsichord. Half course. *Parkins*
- 98. Guitar. Half course. *Lile or Reed*

**Ensemble Classes: pass/fail**

- 100. Symphony Orchestra. Quarter course. *Muti*
- 101. Wind Symphony. Quarter course. *Staff*
- 102. Marching Band. Quarter course. *Boumpani*
- 103. Jazz Ensemble. Quarter course. *Jeffrey*
- 104. Small Jazz Ensemble. Quarter course. *Jeffrey*
- 105. Collegium Musicum. Quarter course. *Staff*
- 106. Chamber Music. Quarter course. *Hawkins*
- 111. Opera Workshop. Quarter course. *Lail*
- 112. Chapel Choir. Quarter course. *Wynkoop*
- 113. Chorale. Quarter course. *Wynkoop*

**Credit in Applied Music.** (Skills courses not applicable to area of knowledge requirements.) Credit for instruction in courses below 100 is granted on the basis of a half course per semester for one hour of private instruction per week; or a half course per year for one half hour of private instruction or one period of class study. An additional weekly class meeting for performance and criticism may be required by the instructor without additional credit.

**Fees.** Applied music instruction in one medium (instrument or voice) is offered free to music majors. There is a fee for additional instruction for music majors and all instruction for nonmajors. For specific information on those fees (for one-hour and half-hour private lessons and half-hour class lessons) consult the Office of the Bursar.

**Fees are not refundable after the final drop/add day.**

No charge is made for practice room facilities for students registered at Duke. A fee schedule for the use of facilities by others is available from the music department office.

*See also Institute of the Arts in this bulletin.*

## **COURSES CURRENTLY UNSCHEDULED**

- 120S. Women in Music. (CZ)
- 139. Twentieth-Century Music. (AL)
- 156S. Music History IIA: Late Renaissance, Baroque. (AL)
- 157S. Music History IIB: Rococo and Classic. (AL)
- 218. Advanced Counterpoint. (AL)
- 222. Music in the Middle Ages. (AL)
- 236. Nineteenth-Century Piano Music. (AL)

## **THE MAJOR**

A major or second major in music is a means of preparing students for further professional training in the branches of the art, for graduate study as historians, composers, and performers, and for a more intimate understanding of one of life's most important experiences. The music major can also be an attractive pursuit for the well-rounded undergraduate planning a career in another field, such as business, law, or medicine. The aim of the required courses is to give a balanced selection of history, theory, composition, and performance, reinforced by constant attention to the art of listening. With the required courses as their foundation, students choose electives to further their interest in, or gifts for, a particular music activity, so that a performer will have a good theoretical background, a historian considerable experience as a player, a composer various kinds of understanding of music of the past, and so on.

Ten courses are required for the major, at least eight of which must be at the level of 100 or above.

**Prerequisites.** Music 65, 66, and one year of applied music study in an instrument or voice; two semesters of participation in a departmental ensemble (excluding Music 102), with or without credit.



*Major Requirements.* Music 116S, 117S, 123 and 124 (two half courses), 155S, 158S, 159S, either 189S or 190S or a 200-level course approved by the director of undergraduate studies, and one additional elective approved by the director of undergraduate studies. For students matriculating before fall 1995, 156S and 157S may replace 159S and either 189S or 190S or an approved 200-level course. Those who plan to study music beyond the undergraduate level are strongly advised to prepare themselves in two or more foreign languages.

*Graduation with Distinction.* Music majors who have earned a minimum 3.5 average in music courses may undertake work leading to Graduation with Distinction. The candidate must make application to the director of undergraduate studies by March 20 of the junior year. The project is normally a year-long endeavor involving an independent study or an appropriate graduate seminar each semester of the senior year. It must culminate in (a) a substantial paper (historical, analytical, or theoretical); or (b) a full-length recital with a shorter paper or composition; or a major composition with a shorter paper or half-length recital. The final project must be approved by a faculty committee.

## THE MINOR

Six full course units (including the prerequisite) are required for the minor, of which at least three full course units must be taken at the 100-level or above. .

*Prerequisite:* Music 65.

*Requirements.* Five full course credits, as follows. Two full course credits, one of which must be in music history, from among: Music 66, 75, 76, 155S, 158S, 159S (students matriculating before fall 1997 may include 156S and 157S); one full course credit in performance from among: Music 79-88, 90-98, 100-101, 103-106, 111-113, 179-184; two additional full course credits in music, one of which must be above 114.

## Naval Science—Navy ROTC (NS)

Professor Guthe, Captain, U.S. Navy, Chair; Visiting Assistant Professor White, Lieutenant, U.S. Navy, *Director of Undergraduate Studies*; Visiting Associate Professor Ceci, Lieutenant Colonel, U.S. Marine Corps; Visiting Assistant Professors Bell, Lieutenant, U.S. Navy, Filan, Lieutenant, U.S. Navy, Lott, Lieutenant, U.S. Navy, and Snyder, Major, U.S. Marine Corps

Courses in naval science are open to all students. The program in naval science offers students an opportunity to gain a broad-based knowledge in naval studies leading to a challenging career as a Navy or Marine Corps officer. Since a major is not available in this program, scholarship program participants are encouraged to pursue majors in technical fields, although a major in any field of study leading to a baccalaureate degree meets the basic requirement. The academic program for an approved degree and commission must include all naval science courses and laboratories. Navy option scholarship students must complete one year of calculus by the end of the sophomore year, one year of calculus-based physics by the end of the junior year, one semester of American military history or national security policy, one year of English, and one semester of computer science.

Nonscholarship Navy option student requirements are one year of mathematics, one year of physical science, one year of English, and one semester of computer science. Marine Corps option students are required to take one semester of American military history or national security policy.

**11. Naval Orientation.** Organization, missions, and branches of specialization within the United States Navy. Customs, traditions, leadership, and career opportunities. *White*

**11L. Naval Orientation Laboratory.** Practical application of the elements and material presented in Naval Science 11. *White*

**12. Naval Ships Systems.** Quantitative study of basic naval ships' systems. Focus on propulsion and various auxiliary systems. Ship design, stability, and damage control. One course. *Lott*

**12L. Naval Ships Systems Laboratory.** Practical application of the theories and principles of naval ships systems. *Lott*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**52. Seapower and Maritime Affairs.** The role of seapower in national and foreign policy, and as an instrument of politico-military strategy. Includes comparative study of United States and Soviet maritime strategies. One course. *White*

**53L. Seapower Laboratory.** Case studies and contemporary issues dealing with United States Navy. Mandatory for Navy ROTC midshipmen. *White*

**126. Concepts and Analyses of Naval Tactical Systems.** Detection systems; systems integration into current naval platforms and their offensive and defensive capabilities. One course. *Lott*

**126L. Naval Tactical Systems Laboratory.** Practical application of the theories and principles of naval tactical systems. *Lott*

**131. Navigation.** Theory, principles, and procedures of ship navigation, movements, and employment. Dead reckoning, piloting, celestial and electronic principles of navigation. Naval Science 131L should be taken concurrently. One course. *Filan*

**131L. Navigation Laboratory.** Practical application of the theories and principles of navigation as presented in the lecture series. *Filan*

**132. Naval Operations.** Components of general naval operations, including concepts and application of tactical formations and dispositions, relative motion, maneuvering board and tactical plots, rules of the road, and naval communications. Naval Science 132L is a concurrent requirement. One course. *Filan*

**132L. Naval Operations Laboratory.** Practical application of the theories of naval operations as presented in the lecture series. *Filan*

**137L, 138L. Marine Tactics Laboratory.** Concepts and applications of tactical employment of Marine amphibious forces. Ground weapons systems, land navigation, and small unit tactics. One course each. *Snyder*

**141S. Evolution of Warfare.** Continuity and change in the history of warfare, with attention to the interrelationship of social, political, technological, and military factors. One course. *Snyder*

**145L. Naval Leadership and Management I.** Study of organizational behavior and management in the context of naval organization. Topics include discussion of leadership and management functions of planning, controlling, and directing. Practical applications explored using case studies. *White*

**146L. Naval Leadership and Management II.** The study of officer responsibilities in naval administration. Discussions of counseling methods, military justice, human resources management, and supply systems. *White*

**147L, 148L. Marine Leadership Laboratory.** Marine Corps career management, naval correspondence, force structure, leadership techniques, and training. One course each. *Snyder*

**151S. Amphibious Operations.** Development of amphibious doctrine, with attention to its current applications. One course. *Snyder*

**191. Independent Study.** Directed reading and research. Open only to qualified students in junior and senior years by consent of director of undergraduate studies. One course. *Staff*

## Neurobiology

For courses in Neurobiology, see Medicine (School)—Graduate (School) Basic Science Courses Open to Undergraduates

## Neurosciences

For courses in neurosciences, see Biology, Psychology, and the Neurosciences Program.

## Neurosciences Program

Associate Professor Meck and Associate Professor Nowicki, *Co-directors*

The study of the nervous system has developed into one of the most exciting areas of modern science with rapidly expanding knowledge in both basic and medically applied areas. The Neurosciences Program offers the student guidance in planning a liberal arts education in the context of a structured emphasis on study in the neural sciences. The program especially encourages and facilitates undergraduate research participation, through independent study courses, in neuroscience laboratories across the university, including the Medicine (School)—Graduate (School) Basic Sciences Department of Neurobiology. The program also sponsors special lectures, workshops, and research mini-symposia throughout the academic year designed to foster undergraduate interest in neurobiology.

B.S. majors in departments other than biology and psychology may complete a sequence of required courses for a Neuroscience Program Certificate by taking the two introductory course requirements (e.g. Psychology 91 and Biology 154/Psychology 135—prerequisites: Biology 25L and Chemistry 12L) and four electives.\* Independent study (Psychology 191-194 and Biology 191-194) is highly recommended for all participants in the program and may be counted toward completion of the elective requirements. In order to ensure interdisciplinaryness no more than one-half the total courses taken to satisfy the specific requirements of the certificate may originate in a single department.

For more information, students should call the Departments of Psychology or Biology, contact either of the program co-directors, Professors Warren Meck (psychology: experimental), e-mail: meck@psych.duke.edu or Stephen Nowicki, e-mail: snowicki@acpub.duke.edu, consult the neuroscience programs world-wide-web homepage at <http://www.duke.edu/neurosci/> or obtain materials at the program office, Rm. 245 Sociology/Psychology.

### Core Courses

#### Biology

154. Principles of Neurobiology. (Cross-listed.) *LaMantia or Nowicki*

#### Neurobiology

154. Principles of Neurobiology. (Cross-listed.) *LaMantia or Nowicki*

#### Psychology

91. Biological Bases of Behavior: Introduction and Survey (B). *C. Erickson or C. Williams*

135. Principles of Neurobiology (B). (Cross-listed.) *LaMantia or Nowicki*

### Elective Courses

The following is a partial listing of representative elective courses. For descriptions, consult the listings under specified departments in the undergraduate and graduate bulletins.

Developmental and Comparative Anatomy of Vertebrates. (Biology 108L.) *Staff*  
Biochemistry of Marine Animals. (Biology 155L.) *Rittschof*

Animal Behavior. (Biology 201L, S.) *Blower*  
 Marine Animal Navigation. (Biology 296S.22.) *Forward*  
 Animal Communication. (Biology 296S.22.) *Nowicki*  
 Learning and Adaptive Behavior. (Psychology 111.) *Higa*  
 Comparative Psychology. (Psychology 120.) *Holland*  
 Behavior and Neurochemistry. (Psychology 126.) *Meck*  
 Fundamental Issues in the Study of the Brain. (Psychology 133.) *W. C. Hall*  
 Psychobiology of Motivation. (Psychology 139.) *Staff*  
 Methods in Behavioral Neurobiology. (Psychology 181A.) *W. G. Hall or staff*  
 Hormones and Behavior. (Psychology 150S.) *Williams*  
 Neurobiology of Learning and Memory. (Psychology 165S.) *Swartzwelder*  
 Brain Mechanisms of Behavior (Psychology 167S). *R. Erickson*  
 Research Methods in Animal Learning. (Psychology 181B). *Higa*  
 Neural Networks and Psychology. (Psychology 182C). *Schmajuk*  
 Independent Study. (Biology 191, 192 and Psychology 191, 192, 193, 194.) *Staff*

\*A neuroscience concentration is available for B.S. majors in biology and psychology. See the Bulletin entries for the Biology Program and the Psychology Department.

## North American Studies Courses (NAS)

North American Studies provides an opportunity to learn about the economies, societies, environments, cultures, and political systems of Mexico, Canada, and the United States in historical, comparative, and regional perspective. For information on North American Studies as a primary or secondary area within the Comparative Area Studies Program see the bulletin entry for Comparative Area Studies.

**110. Introduction to North America.** (CZ, SS) The geography, history, politics, economics, and cultural productions of Canada, the United States, and Mexico, with some reference to the Caribbean. C-L: Cultural Anthropology 129, Economics 115, History 108F, Latin American Studies, Political Science 119, Public Policy Studies 115, Romance Studies 125, and Sociology 109. One course. *Thompson*

**283S. Seminar in North American Studies.** (CZ) Comparative topics varying from semester to semester. C-L: Cultural Anthropology 283S, History 283S, Political Science 285S, Public Policy Studies 282S, Romance Studies 283S, and Sociology 283S. One course. *Staff*

## Pathology

For courses in pathology, see Medicine (School)—Graduate (School) Basic Science Courses Open to Undergraduates.

## Pharmacology

For courses in pharmacology, see Medicine (School)—Graduate (School) Basic Science Courses Open to Undergraduates.

## Perspectives on Marxism and Society (MRX)

Professor Jameson, *Chair*

A six-course certificate, but not a major, is available in this program. The Perspectives on Marxism and Society Program is devoted to the study of Marxist theories of society. The focus is on Marxism, not primarily as a political or ideological system, but as a scholarly methodology incorporating a variety of analytical techniques across a wide range of disciplines. Emphasized is a critical appraisal of Marxist methods of analysis and their social implications, considered in the light of theoretical alternatives and changing historical circumstances. Topics covered include sexual and racial inequality, alienation, development and underdevelopment in the world system, labor processes, protest movements, and ideologies.



The program requires an analytical core course, *Marxism and Society* (cross-listed as Cultural Anthropology 139, Education 139, History 186, Literature 181, and Sociology 139). Five additional approved courses satisfy the requirements of the Program. No more than three courses originating in a single department or program may satisfy the program of study. Of the five approved courses, at least three must be at the 100 level or above. Further information may be obtained by writing the Director, Professor Fredric Jameson, Literature Program, Box 90670, jameson@acpub.duke.edu

## REGULARLY SCHEDULED COURSES

### African and African-American Studies

- 70, 71. *The Third World and the West*. (Cross-listed.) *Staff*  
 122. *Culture and Politics in Africa*. (Cross-listed.) *Piot*  
 165. *History of the Working Class in the United States*. (Cross-listed.) *Keyssar*

### Art History

168. *Art since 1945: Modernism and Postmodernism*. (Cross-listed.) *Stiles*  
 189. *Modern and Postmodern Architecture*. (Cross-listed.) *Wharton*

### Comparative Area Studies

125. *Comparative Approaches to Global Issues*. (Cross-listed.) *Staff*

### Cultural Anthropology

104. *Anthropology and Film*. (Cross-listed.) *Litzinger*  
 113. *Gender and Culture*. (Cross-listed.) *Allison or Silverblatt*  
 117. *Global Culture*. (Cross-listed.) *Piot*  
 122. *Culture and Politics in Africa*. (Cross-listed.) *Piot*  
 125. *Comparative Approaches to Global Issues*. (Cross-listed.) *Staff*  
 127. *Culture and Politics in Japan*. (Cross-listed.) *Allison*  
 128. *Culture and Politics in Latin America*. (Cross-listed.) *Starn*  
 139. *Marxism and Society*. (Cross-listed.) *Staff*

### Education

100. *Social and Philosophical Foundations of Education*. (Cross-listed.) *Di Bona*  
 139. *Marxism and Society*. (Cross-listed.) *Staff*

### English

- 101B. *Introduction to Cultural Studies*. (Cross-listed.) *Gaines, Radway, Surin, or Willis*

### German

270. *Consciousness and Modern Society*. (Cross-listed.) *Rolleston*

### History

- 75, 76. *The Third World and the West*. (Cross-listed.) *Staff*  
 111C. *The Emergence of Modern America: The United States from the 1890s to the Cold War*. (Cross-listed.) *Keyssar*  
 137. *Comparative Approaches to Global Issues*. (Cross-listed.) *Staff*  
 142A. *China: Roots of Revolution*. (Cross-listed.) *Dirlik or Mazumdar*  
 142B. *China since 1949: The People's Republic*. (Cross-listed.) *Dirlik or Mazumdar*  
 150A. *Documentary Film History*. (Cross-listed.) *Gaines*  
 153. *The Insurgent South*. (Cross-listed.) *Goodwyn*  
 163C. *The American Civil War*. (Cross-listed.) *Goodwyn*  
 165. *History of the Working Class in the United States*. (Cross-listed.) *Keyssar*  
 185A. *Socialist Realism: Soviet Literature of the 1930s and 1940s*. (Cross-listed.) *Lahusen*  
 186. *Marxism and Society*. (Cross-listed.) *Staff*

### Literature

98. *Introduction to the Study of Literature and Society*. (Cross-listed.) *Lentricchia or Willis*  
 100. *Introduction to Cultural Studies*. (Cross-listed.) *Gaines, Radway, Surin, or Willis*  
 117. *Documentary Film History*. (Cross-listed.) *Gaines*  
 162. *Special Topics in Literature and National Cultures, Ethnicity, Race*. (Cross-listed.) *Lubiano*  
 181. *Marxism and Society*. (Cross-listed.) *Staff*

## Political Science

125. Comparative Approaches to Global Issues (B). (Cross-listed.) *Staff*  
198. Documentary Film History (B). (Cross-listed.) *Gaines*

## Religion

183. Comparative Approaches to Global Issues. (Cross-listed.) *Staff*

## Russian

130. Soviet Cinema. (Cross-listed.) *Gaines, Jameson, and Lahusen*  
149S. Russian Culture in the Era of Terror: A Reexamination. (Cross-listed.) *Lahusen*  
181. The Soviet 1920s: The Road to a New Synthesis. (Cross-listed.) *Lahusen*  
182. Socialist Realism: Soviet Literature of the 1930s and 1940s. (Cross-listed.) *Lahusen*

## Sociology

125. Comparative Approaches to Global Issues. (Cross-listed.) *Staff*  
139. Marxism and Society. (Cross-listed.) *Staff*

## Spanish

148. Colonial and Postcolonial Studies in Latin America and the Caribbean. (Cross-listed.) *Mignolo*  
171. Literature of Contemporary Spain. (Cross-listed.) *Vilarós*  
251S. Spanish Film. (Cross-listed.) *Vilarós*

## LECTURE/SPECIAL TOPICS COURSES OFFERED PERIODICALLY

### Art History

187. Surrealism. *Stiles*  
188. Twentieth-Century Modernist and Postmodernist Criticism. *Stiles*

### Asian and African Languages and Literature

155. Introduction to Israeli Culture. *Zakim*  
162. Modern Japanese Fiction in Translation. *Ching*

### Cultural Anthropology

121. Culture and Politics in China. *Litzinger*

### History

- 114B. Immigration, Migration, and Mobility of Labor. *Keysaar*  
139A. Radical Movements in Modern Asia. *Dirlik*  
172B. China and West. *Mazumdar*

### Literature

114. Film Theory. *Gaines*  
144S. Special Topics in Literature and Revolution. *Hardt*

### Political Science

181. Marxism and Neo-Marxism. *Coles*

## Persian

For courses in Persian, see Asian and African Languages and Literature.

## Philosophy (PHL)

Professor MacIntyre, *Acting Chair*; Professor Sanford, *Director of Undergraduate Studies*; Professors Brandon, Flanagan, Golding, Joy, and Mahoney; Associate Professors Ferejohn, Posy, Schmaltz, and Stone (law); Assistant Professors Cooper and Güzeldere; Professors Emeriti Peach and Welsh; Adjunct Associate Professor Ward

A major or minor is available in this department.

The undergraduate program in the Department of Philosophy acquaints students with the content and the structure of philosophical theory in various areas. Discussion is encouraged so that students can engage actively in the philosophical examination of problems.

Course offerings fall into two general categories: the systematic and the historical. In a systematic treatment, the organization of a course is primarily in terms of the problems presented by the subject matter of that course, as in logic, ethics, and metaphysics. In historical courses, attention is directed more to the order of development in the thought of a

particular philosopher (Plato, Aristotle, Kant) or in a historical period. In all courses, reading of the works of philosophers acquaints the students with the important and influential contributions to the definition and solution of philosophical issues.

The problems raised in philosophy in respect to the various fields of the arts and sciences involve questions that are not normally given attention in those particular disciplines. In the consideration of such problems, therefore, it is expected that students will acquire some understanding and perspective of the major areas of the human intellectual endeavor. In this sense, philosophical comprehension is an essential part of a student's learning and education.

Philosophy provides a sound preparation for the demands of many professions. For example, the precision of argument and broad acquaintance with intellectual traditions emphasized in philosophy form an excellent basis for the study of law. Only one course from among Philosophy 41, 42, 43S, and 44S may be taken for credit. These courses are not open to juniors and seniors.

**41. Introduction to Philosophy. (CZ)** Examination of problems in philosophy; emphasis on metaphysics and theory of knowledge. One course. *Staff*

**42. Introduction to Philosophy. (CZ)** Examination of problems in philosophy; emphasis on ethics and value theory. One course. *Staff*

**43S. Introduction to Philosophy. (CZ)** Philosophy 41 conducted as a seminar. One course. *Staff*

**44S. Introduction to Philosophy. (CZ)** Philosophy 42 conducted as a seminar. One course. *Staff*

**48. Logic. (CZ)** The conditions of effective thinking and clear communication. Examination of the basic principles of deductive reasoning. One course. *Brandon, Güzeldere, Posy, Sanford, or staff*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**100. History of Ancient Philosophy. (CZ)** The pre-Socratics, Socrates, Plato, Aristotle, and post-Aristotelian systems. Not open to students who have taken Classical Studies 93 or Philosophy 93. C-L: Classical Studies 100. One course. *Ferejohn, Joy, or Mahoney*

**101. History of Modern Philosophy. (CZ)** Bacon, Hobbes, Descartes, Spinoza, Leibniz, Locke, Berkeley, Hume, and Kant. Not open to students who have taken Philosophy 94. One course. *Joy, Posy, or Schmaltz*

**102. Aesthetics: The Philosophy of Art. (CZ)** The concept of beauty, the work of art, the function of art, art and society, the analysis of a work of art, criticism in the arts. One course. *Ward*

**103. Symbolic Logic. (CZ)** Detailed analysis of deduction and of deductive systems. Open to sophomores by consent of instructor. C-L: Linguistics. One course. *Brandon, Güzeldere, or Posy*

**104. Philosophy of Science. (CZ)** The principal philosophical and methodological problems in contemporary science. One course. *Brandon, Cooper, or Güzeldere*

**106. Philosophy of Law. (CZ)** Natural law theory, legal positivism, legal realism, the relation of law and morality. One course. *Golding*

**107. Political and Social Philosophy. (CZ)** The fundamental principles of political and social organizations. One course. *Mahoney*

**109. Philosophy of Language. (CZ)** A philosophical analysis of problems arising in the study of language and symbolism. Topics include: theories of language, the nature of signs and

symbols, theories of meaning, types of discourse (scientific, mathematical, poetic), definition, ambiguity, metaphor. C-L: Linguistics. One course. *Posy*

**110. Knowledge and Certainty. (CZ)** Problems in the theory of knowledge: conditions of knowledge, scepticism, perception, memory, induction, knowledge of other minds, and knowledge of necessary truths. One course. *Ferejohn or Sanford*

**111. Appearance and Reality. (CZ)** Problems in metaphysics: theories of existence, substance, universals, identity, space, time, causality, determinism and action, and the relation of mind and body. One course. *Ferejohn or Sanford*

**112. Philosophy of Mind. (CZ)** Such topics as mind and body, the nature of thought, perception, consciousness, personal identity, and other minds. The relevance of cognitive psychology, neuroscience, and computer science to the philosophy of mind. C-L: Linguistics. One course. *Flanagan, Güzeldere, or Sanford*

**113. Philosophy of Mathematics. (CZ)** Survey of mathematical thought including the nature of infinity, Platonism, constructivism, and the foundational crisis of the early twentieth century. Prerequisite: one course in calculus or logic or philosophy; or consent of instructor. One course. *Posy*

**115. Environmental Ethics. (CZ)** Critical investigation of the goals of environmental policy and the values to which these goals give expression. Various "land health" issues such as biodiversity, ecosystem preservation, ecological restoration, agricultural practice, and pollution. One course. *Cooper*

**116. Systematic Ethics. (CZ)** Problems in moral philosophy: the nature of morality, ethical relativism, egoism, utilitarianism. Both historical and contemporary readings, with emphasis on the latter. One course. *Flanagan or Golding*

**117. Ancient and Modern Ethical Theories. (CZ)** The development of ethical thought in the West; the interaction between culture and ethical theory, with special reference to the Greek city-state, Roman law, the Renaissance, the Reformation, and the rise of modern science. Readings in the great ethical philosophers. Open only to undergraduates. One course. *Flanagan, Golding, or MacIntyre*

**118. Philosophical Issues in Medical Ethics. (CZ)** Ethical issues arising in connection with medical practice and research and medical technology. Definition of health and illness; experimentation and consent; genetic counseling and biological engineering; abortion, contraception, and sterilization; death and dying; codes of professional conduct; and the allocation of scarce medical resources. Prerequisites: for freshmen, previous philosophy course and consent of instructor. One course. *Brandon, Cooper, or Golding*

**119. Medieval Philosophy. (CZ)** Christian, Islamic, and Jewish philosophy from late antiquity to 1300. Special emphasis on historical influences and institutional developments. Nature and destiny of humans, existence and nature of God, problem of ethical norms, political philosophy. C-L: Medieval and Renaissance Studies. One course. *Mahoney*

**120. Late Medieval and Renaissance Philosophy. (CZ)** Problems of political authority and nature of the state, mysticism, humanism, critical trends, background of Galileo, and impact of the Reformation related to cultural and institutional changes. C-L: Medieval and Renaissance Studies. One course. *Mahoney*

**122. Philosophical Issues in Feminism. (CZ)** Issues in political and moral philosophy in their bearing on feminist concerns, including political equality and rights, preferential treatment, feminist and nonfeminist critiques of pornography, and the morality of abortion. C-L: Women's Studies. One course. *Staff*



**124. Philosophy of Education. (CZ)** Alternative models of the educational process and of the relationship between education and moral development. The ideal of the "educated individual": education vs. training. The ideal of liberal learning: its moral context and its presuppositions. The educational process and its institutional settings. Readings from Plato, Aristotle, Aquinas, Rousseau, Kant, Whitehead, and others. One course. *Ward*

**125. Philosophy of Music. (CZ)** The nature of music and its place in the arts. Emotion and meaning, creation and interpretation in music. Readings from a wide variety of sources. One course. *Ward*

**126. Philosophy of Sport. (CZ)** Play, sport, and game in western culture. Sport and leisure. Sport vs. athletics. The discipline of the body. Competition and the urge to win. The concept of the "team" and ideals of individual performance. Spectatorship. The amateur and the professional. One course. *Ward*

**130. Philosophy of Religion. (CZ)** Selected concepts and doctrines. One course. *Schmaltz*

**131. Kant. (CZ)** Immanuel Kant's philosophy, its background and influence. His early work in metaphysics and ethics and his mature philosophy of the "Critical Period" in which he wrote *The Critique of Pure Reason*, *The Critique of Practical Reason*, and *The Critique of Judgment*. Prerequisite: Philosophy 101. One course. *Posy*

**132. Nineteenth-Century Philosophy. (CZ)** Emphasis on Hegel, Marx, and Nietzsche. Open to undergraduates only. One course. *MacIntyre*

**134. Existentialism. (CZ)** Themes and approaches in existential philosophy. Selected writings of Kierkegaard, Tolstoy, Dostoevsky, Heidegger, and Sartre. Contemporary relevance of existentialist perspectives. One course. *Ward*

**139. Twentieth-Century Continental Philosophy. (CZ)** A critical and historical examination of movements in European philosophy such as existentialism, structuralism, poststructuralism, hermeneutics, and critical theory. Husserl, Heidegger, Sartre, Gadamer, Habermas, and Derrida: their views of language, history, and the problems of modern society. Open to undergraduates only. One course. *MacIntyre*

**150. Logic and Its Applications. (QR)** Prerequisite: a course in logic or consent of instructor. See C-L: Mathematics 188; also C-L: Computer Science 148. One course. *Staff*

**191, 192, 193, 194. Independent Study.** Directed reading and research. Open only to highly qualified students in the junior and senior year with consent of the department. One course each. *Staff*

**195. Special Topics in Philosophy.** One course. *Staff*

**196S, 197S, 198S, 199S. Seminars in Philosophy. (CZ)** One course each. *Staff*

#### **For Seniors and Graduates**

**203S. Contemporary Ethical Theories. (CZ, SS)** The nature and justification of basic ethical concepts in the light of the chief ethical theories of twentieth-century British and American philosophers. Consent of instructor required. C-L: Political Science 289S and Women's Studies. One course. *Flanagan, Golding, or MacIntyre*

**206S. Responsibility. (CZ)** The relationship between responsibility in the law and moral blameworthiness; excuses and defenses; the roles of such concepts as act, intention, motive, ignorance, and causation. One course. *Golding*

**208S. Political Values. (CZ)** Analysis of the systematic justification of political principles and the political values in the administration of law. One course. *Golding*

**211S. Plato. (CZ)** Selected dialogues. C-L: Classical Studies 211S. One course. *Ferejohn*

**217S. Aristotle. (CZ)** Selected topics. C-L: Classical Studies 217S. One course. *Ferejohn*

**218S. Medieval Philosophy. (CZ)** Selected problems. C-L: Medieval and Renaissance Studies. One course. *Mahoney*

**219S. Late Medieval and Renaissance Philosophy. (CZ)** Selected problems. C-L: Medieval and Renaissance Studies. One course. *Mahoney*

**220. The Presocratic Philosophers. (CZ, FL)** See C-L: Greek 220. One course. *Clay*

**225S. British Empiricism. (CZ)** A critical study of the writings of Locke, Berkeley, or Hume with special emphasis on problems in the theory of knowledge. One course. *Schmaltz*

**227S. Continental Rationalism. (CZ)** A critical study of the writings of Descartes, Spinoza, or Leibniz with special emphasis on problems in the theory of knowledge and metaphysics. One course. *Schmaltz*

**228S. Recent and Contemporary Philosophy. (CZ)** A critical study of some contemporary movements, with special emphasis on analytic philosophers. C-L: Linguistics. One course. *Posy*

**231S. Kant's Critique of Pure Reason. (CZ)** One course. *Posy*

**232S. Recent Continental Philosophy.** Selected topics. One course. *Joy*

**233S. Methodology of the Empirical Sciences. (CZ)** Recent philosophical discussion of the concept of a scientific explanation, the nature of laws, theory and observation, probability and induction, and other topics. Consent of instructor required. One course. *Brandon or Cooper*

**234S. Problems in the Philosophy of Biology. (NS)** Selected topics, with emphasis on evolutionary biology: the structure of evolutionary theory, adaptation, teleological or teleonomic explanations in biology, reductionism and organicism, the units of selection, and sociobiology. Consent of instructor required. C-L: Biology 234S, Botany 234S, and Zoology 234S. One course. *Brandon*

**240S. Philosophical Psychology. (CZ)** A study of recent work on the nature of the self and the nature and function of consciousness. Work from philosophy, psychology, cognitive neuroscience, and evolutionary biology will be discussed. One course. *Flanagan*

**251S. Epistemology. (CZ)** Selected topics in the theory of knowledge; for example, conditions of knowledge, scepticism and certainty, perception, memory, knowledge of other minds, and knowledge of necessary truths. One course. *Sanford*

**252S. Metaphysics. (CZ)** Selected topics: substance, qualities and universals, identity, space, time, causation, and determinism. One course. *Sanford*

**253S. Philosophy of Mind. (CZ)** Analysis of concepts such as thought and belief; issues such as mind-body relations, thought and action, the nature of persons and personal identity. One course. *Flanagan, Güzeldere, or Sanford*

**273S. Heidegger. (CZ, SS)** See C-L: Political Science 273S. One course. *Gillespie*

**289S. Environmental Ethics. (CZ)** Selected topics involving values and the environment, for example, extending morality to nature, rights of future generations, environmental

aesthetics, diversity and stability, ideological biases in ecological knowledge. Consent of instructor required. C-L: Environment 282S. One course. *Cooper*

291S, 292S. Special Fields of Philosophy. (CZ) One course each. *Staff*

### COURSES CURRENTLY UNSCHEDULED

- 105. Philosophy of History. (CZ)
- 108. Social Ideals and Utopias. (CZ)
- 114D. Hellenistic Philosophy. (CZ)
- 121. Philosophy and Film. (CZ)
- 123. Aristotle. (CZ)
- 135. Philosophy in Literature. (CZ)
- 138. Analytic Philosophy in the Twentieth Century. (CZ)
- 202S. Aesthetics: The Philosophy of Art. (CZ)
- 204S. Philosophy of Law. (CZ)
- 205S. Philosophy of History. (CZ)
- 210. Logic for Computer Science. (QR)
- 235S. Nineteenth-Century German Philosophy. (CZ)
- 250S. Topics in Formal Philosophy. (CZ)
- 254S. Topics in Philosophy of Religion. (CZ)

### THE MAJOR

*Requirements.* Ten courses in philosophy, eight of which must be at the 100 level or above. The courses must include Philosophy 100 and 101; a course at the 100 level or above in value theory (for example, ethics, political philosophy); and at least one seminar at the 200 level. In addition, a course in logic (Philosophy 48) is highly recommended.

### Graduation with Distinction

The department offers work leading to graduation with distinction. See the section on honors in this bulletin.

### THE MINOR

*Requirements.* At least five courses, no more than two of which may be below the 100 level. No specific courses are required. All students who wish to pursue a minor are encouraged to seek advice from faculty members in the department.

## Physics (PHY)

Professor Müller, *Chair*; Assistant Professor Gauthier, *Director of Undergraduate Studies*; Professors Behringer, Evans, Fortney, Han, Johnson, Madey, Palmer, Roberson, Thomas, Walter, and Weller; Associate Professors Greenside, Howell, Litvinenko, Oh, and Teitsworth; Assistant Professors Chandrasekharan, DeBraekeleer, Lee, Matveev, Plesser, O'Shea, Socolar, and Springer; Professors Emeriti Bilpuch, Fairbank, Lewis, Meyer, Robinson, and Walker; Research Professor Tornow; Research Assistant Professor Phillips; Adjunct Professors Ciftan, Guenther, Iafrate, Rogosa, and Stroschio; Adjunct Associate Professors Lawson and Skatrud; Adjunct Assistant Professors Everitt and Kolena; Visiting Professor Matinyan; Visiting Assistant Professor Brown; Lecturing Fellows Johnson and Murphy; Lecturer Haque

A major or a minor is available in this department.

Through the study of physics, students undertake a systematic examination of the objects that make up the natural universe and their interactions with each other. The

knowledge and analytical skills thus obtained are basic to the study of the sciences and engineering. The department offers a number of courses for nonspecialists who wish to learn about the physicist's description of nature for its intrinsic intellectual value.

**21, 22. Introductory Physics.** Credit for Advanced Placement on the basis of the College Board Examinations "Physics-C" with a score of 4 or 5. Available only to Trinity College students. One course each.

**32. Physics from the Historical Perspective. (NS)** The historical development of physical theories is traced from early theories of the solar system to relativity and quantum theory. No previous study of physics is assumed, but the student must be able to use simple mathematics through basic algebra. One course. *Walker*

**35. Conceptual Physics. (NS)** Physical concepts relevant to common experience. Principles of mechanics, sound, electromagnetism, light, and microscopic structure, discussed with an emphasis on application to familiar phenomena and devices. Intended for persons not majoring in science or engineering; no previous knowledge of physics assumed. One course. *Socolar*

**36. Acoustics and Music. (NS)** The physical principles underlying musical instruments, room acoustics, and the human ear. Analysis, reproduction, and synthesis of musical sounds. No previous knowledge of physics is assumed. C-L: Music 36. One course. *Lawson*

**41L, 42L. Fundamentals of Physics. (NS)** For students interested in majoring in physics; taken in the freshman year. Basic principles of physics, mainly classical, at a level similar to Physics 51L, 52L, but with emphasis on laying a foundation for further study. Lecture, recitations, and laboratory. Closed to students having credit for Physics 51L, 52L. Prerequisites: consent of director of undergraduate studies; Mathematics 31 and 32 may be taken concurrently. One course each. *Lee or O'Shea*

**47S. Physics and the Universe. (NS)** Same as Physics 48S, but emphasizing additional topics considered appropriate for the Origins Program (FOCUS). Introduction to the concepts and discoveries of modern cosmology, exploring issues such as Einstein's theory of relativity, the Big Bang, the origins of matter, and the origins of the laws of nature. Open only to students in that program. One course. *Müller*

**48S. The Emergence of Complexity. (NS)** How complex structures and phenomena arise out of the relatively simple underlying laws of physics and the operation of chance. Topics include physical, chemical, and social systems, in particular: pattern formation, condensed matter, cascades, and emergent functionality. Introduction to the statistical concepts and methods that form the foundation of the science of complexity. One course. *Palmer*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**51L, 52L. Introductory Technical Physics. (NS)** A survey of the principles of classical physics, intended principally for students in the physical sciences and engineering. Students planning a major in physics should enroll instead in Physics 41L, 42L in their freshman year. Physics 51L is closed to students having credit for Physics 41L or Physics 53L; Physics 52L is closed to students having credit for Physics 42L, 53L or Physics 54L. Prerequisite: Mathematics 31, 32 or equivalent; Mathematics 32 may be taken concurrently with Physics 51L; for 52L: Physics 51L or 41L. One course each. *Staff*

**53L, 54L. General Physics. (NS)** A survey of the principles of physics, intended mainly for students planning study in medicine or the life sciences. The level and coverage are similar to that of Physics 51L, 52L, but there are differences in emphasis. Students planning a major in physics should enroll in Physics 41L, 42L in their freshman year. Physics 53L is closed to students having credit for Physics 41L or Physics 51L; Physics 54L is closed to students



having credit for Physics 42L or Physics 52L. Prerequisite: Mathematics 31, 32 or 25L, 26L, or equivalent; Mathematics 32 may be taken concurrently with Physics 53L; for 54L: Physics 41L, 51L or 53L. One course each. *Staff*

**55. Introduction to Astronomy. (NS)** The evolving theory of the physical universe. Cosmological models, galaxies, stars, interstellar matter, the solar system, and experimental techniques and results. Several observatory sessions. One course. *Everitt*

**100. Introduction to Modern Physics. (NS)** Survey of modern physics including relativity and the quantum physics of atoms, nuclei, particles, and quarks. Not applicable toward a major in physics. Prerequisites: Physics 42L, 52L, or 54L and Mathematics 103 (may be taken concurrently). One course. *Han*

**105. Introduction to Astrophysics. (NS)** Basic principles of astronomy treated quantitatively. Cosmological models, galaxies, stars, interstellar matter, the solar system, and experimental techniques and results. Prerequisites: Mathematics 31 and Physics 42L, 52L, 54L or consent of instructor. One course. *Kolena*

**143L. Optics and Modern Physics. (NS)** Intended as a continuation of Physics 41L, 42L. Classical wave and ray optics. Introduction to quantum physics. Prerequisites: Physics 42L, 52L, or 54L and Mathematics 103 (may be taken concurrently). One course. *DeBraeckelee*

*Physics 42L, 52L, or 54L or equivalent, and Mathematics 103 or equivalent are prerequisites to all of the following courses.*

**171L. Electronics. (NS)** Elements of electronics including circuits, transfer functions, solid-state devices, transistor circuits, operational amplifier applications, digital circuits, and computer interfaces. Lectures and laboratory. One course. *Fortney*

**176. Thermal Physics. (NS)** Thermal properties of matter treated using the basic concepts of entropy, temperature, chemical potential, partition function, and free energy. Topics include the laws of thermodynamics, ideal gases, thermal radiation and electrical noise, heat engines, Fermi-Dirac and Bose-Einstein distributions, semiconductor statistics, kinetic theory, and phase transformations. Prerequisites: Mathematics 103 or equivalent and Physics 51L, 52L or equivalent. C-L: Electrical Engineering 176. One course. *Socular*

**181. Introductory Mechanics. (NS)** Newtonian mechanics at the intermediate level, Lagrangian mechanics, linear oscillations, chaos, dynamics of continuous media, motion in noninertial reference frames. Prerequisite: Mathematics 111 or equivalent (may be taken concurrently). One course. *Gauthier*

**182. Electricity and Magnetism. (NS)** Electrostatic fields and potentials, boundary value problems, magnetic induction, energy in electromagnetic fields, Maxwell's equations, introduction to electromagnetic radiation. Prerequisite: Mathematics 111 or equivalent. One course. *Evans*

**185. Modern Optics I. (NS)** Optical processes including the propagation of light, coherence, interference, and diffraction. Consideration of the optical properties of solids with applications of these concepts to lasers and modern optical devices. Lecture and laboratory projects. C-L: Electrical Engineering 274. One course. *Guenther*

**191, 192. Independent Study.** Consent of instructor required. One course each. *Staff*

### **For Seniors and Graduates**

**205. Introduction to Nuclear Physics. (NS)** Phenomenological aspects of nuclear physics, interaction of gamma radiation and charged particles with matter, nuclear detectors, particle

accelerators, radioactivity, basic properties of nuclei, nuclear systematics, nuclear reactions, particle scattering, nuclear models of the deuteron, nuclear forces, parity. One course. *Weller*

**211. Fundamentals of Quantum Mechanics. (NS)** Waves and particles, Schrödinger equation, Dirac notation and mathematical tools, fundamental postulates, angular momentum and addition of angular momentum, applications to spin systems, harmonic oscillators, and the hydrogen atom. Prerequisites: Mathematics 111 and Physics 181. One course. *Springer*

**212. Applications of Quantum Mechanics. (NS)** Application of the fundamental postulates to atomic structure and spectra, solid state phenomena, statistical physics, scattering, perturbative techniques, treatment of systems of identical particles, and nuclear and particle physics phenomenology. Prerequisite: Physics 211. One course. *Plesser*

**213. Nonlinear Dynamics. (QR)** Prerequisites: Computer Science 6, Mathematics 111, and Physics 51L, 52L. See C-L: Computer Science 264. One course. *Behringer or Greenside*

**214. Introduction to Solid-State Physics. (NS)** Discussion of solid-state phenomena including crystalline structures, X-ray and particle diffraction in crystals, lattice dynamics, free electron theory of metals, energy bands, and superconductivity, with emphasis on understanding electrical and optical properties of solids. Prerequisite: quantum physics at the level of Physics 143L or Electrical Engineering 211. C-L: Electrical Engineering 214. One course. *Daniels-Race or Teitsworth*

**217S. Advanced Physics Laboratory and Seminar. (NS)** Experiments involving the fields of electricity, magnetism, heat, optics, and modern physics. One course. *Howell*

**222S. General Relativity. (NS)** Review of special relativity; ideas of general relativity; mathematics of curved space-time; formation of a geometric theory of gravity; Einstein field equation applied to problems such as the cosmological red-shift and blackholes. Prerequisites: Physics 181 and Mathematics 111 or equivalents. One course. *Lee*

**225, 226. Elementary Investigations. (NS)** Training in the laboratory and library methods of physical research. Qualified students may conduct elementary investigations under the supervision of a member of the staff. One course each. *Staff*

**230. Mathematical Methods in Physics. (QR)** Includes topics in complex analysis, residue calculus, infinite series, integration, special functions, Fourier series and transforms, delta functions, and ordinary differential equations; and use of MATHEMATICA for graphical, symbolic, and numerical computation. Prerequisite: Mathematics 111. One course. *Matveev*

**261. Laser Physics. (NS)** Laser physics and laser theory. Electromagnetic radiation and its interaction with matter. Laser excitation, oscillation, modulation, and detection theory. Prerequisites: Electrical Engineering 170L or Physics 182 and Electrical Engineering 211 or Physics 211. C-L: Electrical Engineering 276. One course. *Skatrud*

**271. Quantum Optics. (NS)** The linear and nonlinear interaction of electromagnetic radiation and matter. Topics include simple theory of lasers, second-harmonic generation, photon echos, bistability, Raman scattering, Brillouin scattering, phase conjugation, two photon lasers, and cooling and trapping of atoms. Prerequisites: Physics 212 and 231. One course. *Thomas*

**281. Classical Mechanics. (NS)** Newtonian, Lagrangian, and Hamiltonian methods for classical systems; symmetry and conservation laws; rigid body motion; normal modes and forced oscillations; small nonlinear oscillations; canonical transformations; Hamiltonian chaos. One course. *Plesser*

**291S. Physics at the Cutting Edge.** (NS) Introduction, for graduates and advanced undergraduates, to research topics at the core of recent advances in physics. Prerequisites: Physics 181, 182, and 211, or equivalents. One course. *O'Shea and Springer*

## **COURSES CURRENTLY UNSCHEDULED**

**102. Applications of Modern Physics in Medicine.** (NS)

**106. Topics in Astrophysics.** (NS)

**186. Modern Optics II.** (NS)

**215. Principles of Quantum Theory.** (NS)

**231. Mathematical Methods in Electromagnetism.** (NS)

**240. Computer Applications to Physical Measurement.** (NS)

**244. Nuclear and Particle Physics.** (NS)

## **THE MAJOR**

Students majoring in physics are prepared for work in a wide variety of commercial and industrial organizations as well as governmental laboratories. They are also prepared for graduate work in physics, engineering and other science disciplines, or for the study of medicine. Students planning to major in physics should enroll in Physics 41L, 42L in their freshman year. They should also arrange to complete the necessary mathematics as soon as possible.

### **For the A.B. Degree**

*Prerequisites.* Physics 41L, 42L or 51L, 52L or 53L, 54L, or equivalents; Mathematics 31, 32, 103, 111, or equivalents, and one additional course at the 100 or 200 level.

*Major Requirements.* Physics 143L, 176, 181, 211, either 171L or 217S, and one other course in physics above 100 except for Physics 230. (For the major, Physics 230 is considered to be a mathematics course.)

### **For the B.S. Degree**

*Prerequisites.* Physics 41L, 42L or 51L, 52L or 53L, 54L, or equivalents; Mathematics 31, 32, 103, 111, or equivalents, and one additional course at the 100 or 200 level.

*Major Requirements.* Physics 143L, 176, 181, 182, 211, 212, two among the laboratory courses 171L, 217S, and 225, plus one other course in physics above 100 except for Physics 230. Students planning graduate study in physics are urged to take one additional elective in physics and one in mathematics. (For the major, Physics 230 is considered to be a mathematics course.)

## **Graduation with Distinction**

The department offers upperclassmen the possibility of being associated with research conducted in the department. This work may lead to graduation with distinction. Consult with the director of undergraduate studies during or before the junior year and see the section on honors in this bulletin.

## **THE MINOR**

*Requirements.* Physics 41L and 42L, or 51L and 52L, or 53L and 54L, or equivalents; Physics 143L; plus two additional physics courses numbered above 100.

## **Polish**

For courses in Polish, see Slavic Languages and Literatures.

## Political Science (PS)

Professor Lange, *Chair*; Associate Professor Eldridge, *Director of Undergraduate Studies*; Professors Aldrich, Ascher, Fish, Gillespie, Grieco, Horowitz, Hough, N. Keohane, R. Keohane, Kitschelt, Kornberg, MacIntyre, Mieczkiewicz, Paletz, Price, and Spragens; Associate Professors Brehm, Coles, Grant, Johns, McKean, Munger, and Niou; Assistant Professors Feaver, Gelpi, Goemans, Gronke, Hamilton, Morgenstern, Orr, Shi, and Stenner; Professors Emeriti Ball, Barber, Braibanti, Cleaveland, Hall, Holsti, and Leach; Adjunct Professors Curtis, Kessler, and O'Barr

A major or a minor is available in this department.

Courses in political science for undergraduates are offered in four fields: (A) American government and politics; (B) comparative government and politics; (C-N) normative political theory/(C-E) empirical political theory and methodology; and (D) international relations, law, and politics. In the course descriptions below the field within which the course falls is indicated by the appropriate letter symbol (A, B, C-N/C-E, D) after the course title. (The area of knowledge designation follows.) Courses numbered from 91 through 94 serve as an introduction both to the study of political science and to the subject matter and approaches of the relevant field. Middle and upper-level courses and seminars (numbered at the 100 and 200 levels respectively) consider in depth particular aspects and topics within the field. Topical introductory seminars are offered to freshmen (49S) and to freshmen and sophomores (60S). In addition, independent study under faculty supervision enables students to explore topics of special interest. See below, following the course descriptions, for the listing of courses by fields, information on internships, and requirements for the major, minor, and honors.

### INTRODUCTORY COURSES

The following courses introduce the study of political science. Courses numbered 49S, 60S, and 91 through 94 serve as introductions to the discipline. Students ordinarily will take at least one of these courses before proceeding to more advanced courses. Some advanced courses may require a particular introductory course as a prerequisite.

**20S. Seminar: Problems in Political Science. (SS)** Special topics courses open only to freshmen.

- A. American Politics
  - B. Comparative Politics
  - C. Political Theory
  - D. International Relations
- One course. *Staff*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**60S. Introductory Seminars in Political Science. (SS)** Special topics courses open only to freshmen and sophomores.

- A. American Government and Politics
  - B. Comparative Government and Politics
  - C. Political Theory
  - D. International Relations
- One course. *Staff*

**90A. American Government and Politics (A).** Credit for Advanced Placement on the basis of the College Board examination in American government and politics. Does not satisfy course requirements of the political science major. One course.



**90B. Comparative Government and Politics (B).** Credit for Advanced Placement on the basis of the College Board examination in comparative government and politics. Does not satisfy course requirements of the political science major. One course.

**91. The American Political System (A).** (SS) Theory and practice of American government and politics; federal-state relations; the separation and interrelationships of the executive, legislative, and judicial branches of government; judicial review; the role of political parties and public opinion; the formulation and execution of domestic and foreign policy; civil liberties. One course. *Staff*

**91D. The American Political System (A).** (SS) Same as Political Science 91 except instruction is provided in two lectures and one small discussion meeting each week. One course. *Staff*

**92. Comparative Politics (B).** (SS) Different types of political systems, their origins and evolution; basis of authority under totalitarian, authoritarian, liberal, and social democratic polities; problems in developing political authority, especially in poor countries via revolution, populism, nationalism, or authoritarianism. C-L: Comparative Area Studies. One course. *Staff*

**92D. Comparative Politics (B).** (SS) Same as Political Science 92 except instruction is provided in two lectures and one small discussion meeting each week. One course. *Staff*

**93. Elements of International Relations (D).** (SS) The nature of international politics, the analysis of national power, the instruments of foreign policy, and the controls of state behavior. One course. *Staff*

**93D. Elements of International Relations (D).** (SS) Same as Political Science 93 except instruction is provided in two lectures and one small discussion meeting each week. One course. *Eldridge or Feaver*

**94. Contemporary Political Ideologies (C-N).** (SS) Liberalism, conservatism, socialism, fascism, and feminism. One course. *Staff*

**94D. Contemporary Political Ideologies (C-N).** (SS) Same as Political Science 94 except instruction is provided in two lectures and one small discussion meeting each week. One course. *Staff*

**98. Introduction to Canada.** (SS) See C-L: Canadian Studies 98; also C-L: Comparative Area Studies, Economics 98, History 98, and Sociology 98. One course. *Staff*

## **COURSES TAUGHT IN DUKE STUDY ABROAD PROGRAMS**

**100, A-V. Duke University Overseas Program.** (SS) This number represents course credit for political science courses taken in Duke University Summer Session Study Abroad Programs or in Duke University semester or academic year programs with overseas universities. Register for program by designated suffix A through V. C-L: Comparative Area Studies. Variable credit.

**100A. Duke Semester/Academic Year Program: Berlin.** (FL, SS)

.01 Environmental Policy in Europe (B). (SS) One course.

.02 Germany of Today: An Ordinary Country? (D). (FL, SS)

Taught in German. One course. C-L: Comparative Area Studies. Variable credit.

**100E. Duke Summer Program: London.** (SS) .01 Media and Politics in Britain (B). C-L: Comparative Area Studies. Two courses.

**100J. Duke Wind Symphony Semester Program: Vienna.** (SS) .01 Government and Politics of Austria in Europe (B). C-L: Comparative Area Studies. One course.

- 100K. Duke Summer Program: London/Cambridge/Edinburgh. (SS)**  
 .01 Anglo-American Constitutionalism, Law, and Legal Institutions (A). One course.  
 .02 British Government and Constitutional Law (B). One course.  
 C-L: Comparative Area Studies. Variable credit.
- 100L, S. Duke Summer Program: Oxford. (SS)**  
 .01 Political System of Modern Britain (B). Two courses.  
 .02 Law and Liability: Personal Injury in Britain and the United States (B). Two courses.  
 C-L: Comparative Area Studies. Variable credit.
- 100M. Duke Summer Program: Spain. (SS)** .01 Government and Politics of Spain (B).  
 Not open to students who have taken Political Science 117: Comparative Government  
 and Politics: Spain. C-L: Comparative Area Studies. One course.
- 100Q. Duke Semester/Academic Year Program: France. (FL, SS)** .01 Introduction to  
 Islam and to Problems in the Middle East (B). C-L: Comparative Area Studies. One  
 course.
- 100U. Duke Summer Program: Korea-Taiwan I. (SS)** .01 Comparative Analysis of  
 Democratic Institutions in East Asia (B). Analysis of the selection and consequences of  
 democratic political institutions in East Asian countries. Topics include electoral  
 systems, districting and timing of elections, presidential and parliamentary systems of  
 executive responsibility, structure of the legislature, formation of parties and governing  
 coalitions, federalism, term limits, plebiscites, constitutional amendments. C-L:  
 Comparative Area Studies. One course.
- 100V. Duke Summer Program: Korea-Taiwan II. (SS)** .01 East Asian Political Economy:  
 Institutions, Networks, and Politics (B). See C-L: Sociology 188C; also C-L: Comparative  
 Area Studies, and Public Policy Studies 100A. One course.

## OTHER UNDERGRADUATE COURSES

- 101C, S. Issues in Twentieth-Century American Political Theory (C-N). (SS)** Seminar on  
 contemporary issues of American political thought. Attempts to refurbish or develop  
 alternatives to the dominant liberal tradition. Open only to students in the Twentieth-  
 Century America (FOCUS) Program. One course. *Staff*
- 103A. Introduction to Urban Politics (A). (SS)** Theory and practice of American city politics:  
 relationships between governmental structures and historical development; distribution of  
 power; constituency demands. C-L: African and African-American Studies 148A. One  
 course. *Orr*
- 103B. Urban Poverty and the Urban Underclass (A). (SS)** The nature and extent of poverty  
 in America's big cities. The causes and consequences of urban poverty and efforts by the  
 national and subnational governments to address them. Particular attention paid to  
 problems and prospects of the working poor and the so-called urban underclass. Heavy  
 focus on survey, ethnographic, and hypotheses advanced to explain the current situation of  
 the urban poor. C-L: African and African-American Studies 148B. One course. *Orr*
- 104. Politics and Literature (C-N). (SS)** The enduring questions of politics and political  
 philosophy illustrated in Western literature: historical, literary, and philosophical analysis.  
 One course. *Gillespie or Grant*
- 105. The Politics of Democratization in Eastern Europe (B). (SS)** Overview of political  
 regimes in selected East European countries, comparative analysis of modes of transition to  
 democracy: constitutionalism, party systems and voting, private property rights and  
 economic regulation under socialism and capitalism. C-L: Comparative Area Studies. One  
 course. *Kitschelt*

**106. International Security (D). (SS)** International conflict in modern times. Causes and effects of war. Contemporary and future threats. One course. *Feaver*

**106D. International Security (D). (SS)** Same as Political Science 106 except instruction is provided in two lectures and one small discussion meeting each week, One course. *Feaver*

**107. Environmental Politics and Policies in the Industrial World (B). (SS)** Comparative analysis of environmental problems, protest, preferred approaches, and policy mix chosen in politically diverse industrialized nations including the United States, Russia, Japan, and those in Europe. C-L: Comparative Area Studies and Public Policy Studies 107. One course. *McKean*

**107D. Environmental Politics and Policies in the Industrial World (B). (SS)** Same as Political Science 107 except instruction is provided in two lectures and one small discussion meeting each week. C-L: Comparative Area Studies and Public Policy Studies 107D. One course. *McKean*

**108. The American Presidency (A). (SS)** The presidency and its impact on the American political system. One course. *Hough or Paletz*

**108S. The American Presidency (A). (SS)** Same as Political Science 108 except in seminar format. One course. *Staff*

**110. American Political Parties (A). (SS)** Introduction to party systems with application to the United States, including parties in the electorate, parties as organizations, and parties in government. One course. *Gronke*

**111. Contemporary Japanese Politics (B). (SS)** Introduction to political change in postwar Japan. Foundations of the modern industrial state, electoral politics, policy-making and bureaucracy, defense, foreign policy, and foreign trade. C-L: Comparative Area Studies. One course. *McKean*

**113A. Issues of International Political Economy I: International Trade (D). (SS)** An examination of international trade policy issues affecting relations among advanced industrial countries, between developed and developing countries, and between industrial and former socialist transitional economies, including the benefits of trade and the sources of trade protection, strategic trade policy, and new problems in trade diplomacy such as environmental and worker standards. Not open to students who have taken Political Science 113. One course. *Grieco*

**113B, D. Issues of International Political Economy II: International Money and Finance (D). (SS)** An examination of international monetary and financial policies of both advanced industrial states and developing countries, including the bases for international currency and capital markets, alternative international monetary systems, macroeconomic policy coordination, and the dynamics of debt and exchange rate crises. Prerequisite: Economics 1D or 51D. One course. *Grieco*

**115. Politics and Society in Germany (B). (SS)** Industrialization, democratization, and fascism in Germany; social structure, political institutions, and political culture; selected public policies; Germany in the world economy and in world politics. C-L: Comparative Area Studies. One course. *Kitschelt*

**116S. Post-World War II Europe and East Asia: A Comparative Perspective (D). (SS)** The nations of contemporary Western Europe as a "zone of peace," a political-geographic space in which cooperation is highly robust and war is virtually unthinkable. The development of that zone in light of the persistence of major war in that area from the late fifteenth to the

mid-twentieth centuries. Close examination of the evolution of Western European politics and institutions since World War II (most importantly, the European Union); comparison with that of East Asia, another key region of the modern world that has not become a zone of peace but in fact may be increasingly a zone of major conflict and even war. One course. *Grieco*

**117. Comparative Government and Politics: Selected Countries (B).** (SS) Special topics course treating the political system of one or more countries from a comparative perspective. One course. *Staff*

**118. Ethnicity and American Foreign Policy (D).** (SS) Ethnicity and its relation to foreign policy from the 1760s to the present. Focuses on the impact of the four great waves of immigration; 1760-1775, and 1880-1915, especially the impact of the latter on American policy before and after World War II. Also examines the impact of foreign policy on identity formation, particularly the merging of "hyphenated-Americans" from Europe into "Whites." One course. *Hough*

**119. Introduction to North America (B).** (CZ, SS) See C-L: North American Studies 110; also C-L: Cultural Anthropology 129, Economics 115, History 108F, Latin American Studies, Public Policy Studies 115, Romance Studies 125, and Sociology 109. One course. *Thompson*

**120. International Conflict and Violence (D).** (SS) Nature and processes of international conflict and violence with emphasis on contemporary instances of violence in international affairs. Consideration of restraints on violence. One course. *Eldridge*

**120S. International Conflict and Violence (D).** (SS) Same as Political Science 120 except in seminar format. One course. *Staff*

**122. Foundations of Modern International Politics (D).** (SS) Interactions between domestic politics and foreign policy-making and their effects on international relations. Problems, institutions, and processes studied under varied methodologies. No prerequisite, but Political Science 93 recommended. One course. *Eldridge or Goemans*

**123. Introduction to Political Philosophy (C-N).** (SS) The nature and enduring problems of political philosophy, illustrated by selected theorists in the Western political tradition. One course. *Staff*

**125. Comparative Approaches to Global Issues (B).** (CZ, SS) Not open to students who have taken Religion 121. See C-L: Comparative Area Studies 125; also C-L: Cultural Anthropology 125, History 137, Perspectives on Marxism and Society, Religion 183, and Sociology 125. One course. *Staff*

**126. Theories of Liberal Democracy (C-N).** (SS) Critical discussion of classic theorists, such as Locke, Rousseau, Mill, and Madison, and contemporary theories of liberal democracy. One course. *Grant or Spragens*

**127. Law and Politics (A).** (SS) Nature and functions of law; Anglo-American legal institutions; the process of judicial decision making; and the relationships among judges, lawyers, legislators, and administrators in the development of public as well as private law. One course. *Fish*

**131. Introduction to American Political Thought (C-N).** (SS) Basic elements in the American political tradition as developed from its English roots to the present. One course. *Grant or Spragens*

**133. Japan in World Politics (D).** (SS) Impact of Japan's anomalous position as a constitutionally pacifist but well-armed economic superpower on relationships with its only ally (the United States), its major trading partners and competitors, and its approach to



multilateral concerns, such as alliance politics, trade rules, development assistance, environmental issues, and the United Nations. How the end of the cold war has altered Japan's priorities and the challenges it faces. C-L: Comparative Area Studies. One course. *McKean*

**136. Comparative Government and Politics: Western Europe (B). (SS)** Modern political institutions and processes of European democracies: political parties, interest groups and parliaments; regional, religious, and class divisions; political participation and mobilization; relationships of state, society and economy; political, social and economic change in postwar Europe. C-L: Comparative Area Studies. One course. *Kitschelt or Lange*

**136D. Comparative Government and Politics: Western Europe (B). (SS)** Same as Political Science 136 except instruction is provided in two lectures and one small discussion meeting each week. C-L: Comparative Area Studies. One course. *Kitschelt or Lange*

**137. Campaigns and Elections (A). (SS)** An introduction to voting and elections in the United States, with emphasis on presidential nomination and election procedures, characteristics of the American electorate, and theories of voting behavior in presidential and congressional elections. One course. *Aldrich, Brehm, Gronke, or Kornberg*

**137D. Campaigns and Elections (A). (SS)** Same as Political Science 137 except instruction is provided in two lectures and one small discussion meeting each week. One course. *Aldrich, Brehm, Gronke, or Kornberg*

**138. Quantitative Political Analysis I (C-E). (QR)** Basic applications of statistical methods to the analysis of political phenomena. Emphasis on research design, graphical display, probability, testing of hypotheses, statistical inference, and the use of computers. One course. *Brehm*

**138D. Quantitative Political Analysis I (C-E). (QR)** Same as Political Science 138 except instruction provided in two lectures and one small discussion meeting each week. One course. *Brehm*

**139. Conflict, Collusion, and Cooperation (C-E). (SS)** How actors in the political process manipulate information, institutions, and strategies to produce preferred outcomes. Applications to elections, legislative behavior, international conflict, and other areas. One course. *Niou*

**140. Feminist Theory (C-N). (SS)** Exploration of contemporary American feminist thought challenging traditional forms of power and the relationship between public and private reason and unreason. Included are works by liberal, radical, lesbian, and socialist feminists as well as works which address issues of concern specific to women of color. C-L: Women's Studies. One course. *Curtis*

**141. Introduction to African-American Politics (A). (SS)** Traces the history, evolution, and maturation of the African-American political experience in America from the colonial period through contemporary times. Impact of African-American political participation on the American political process and American public policy. C-L: African and African-American Studies 149. One course. *Orr*

**142. War and Peace (D). (SS)** The use of systems theory in comparative political history to explain why some international systems during particular periods have been plagued by war while others have been relatively peaceful. Special attention given to the Bismarckian system. One course. *Staff*

**142S. War and Peace (D). (SS)** Same as Political Science 142 except in seminar format. One course. *Staff*

**143. Ethnicity, Religion, and American Parties (A).** (SS) The extent to which social class or ethnicity and religion have been the bases of American political parties from the eighteenth century to the present—and, therefore, the relationship of economic and social issues in American campaigns. One course. *Hough*

**145. Political Analysis for Public Policy-Making (A).** (SS) Prerequisite: Political Science 90A, 91, 101, or equivalent. See C-L: Public Policy Studies 114. One course. *Ascher, Fischle, Hamilton, Mayer, or Mickiewicz*

**146D. American Legislative Behavior (A).** (SS) An introduction to the American legislative process, with specific focus on the U.S. Congress. Emphasis on legislative rules and procedures, congressional elections, and the behavior of legislators in their representative and policy-making roles. One course. *Gronke*

**147. Environmental Politics and Policies in the Developing World (B).** (SS) Problems of sustainable development and early industrialization in the Third World; special focus on land use, agriculture, deforestation, desertification, wildlife, water, and population growth, Third World cities, early industrialization, and aid for development projects. C-L: Comparative Area Studies and Public Policy Studies 147. One course. *McKean or Miranda*

**148D. Environmental Politics Beyond Borders (D).** (SS) International environmental problems and politics, from transboundary pollution (for example, acid rain, international rivers) to degradation of global commons (global warming, biodiversity, ozone, overfishing, and pollution of the high seas). Includes issues of trade, investment, debt, and transnational corporations. C-L: Comparative Area Studies and Public Policy Studies 143D. One course. *McKean*

**150S. The Individual and Society: The Classical View (C-N).** (CZ) Ancient political philosophy and drama emphasizing the case of Socrates. Readings include Plato's *Republic*, *Apology*, and *Crito*; Aristophanes' *The Clouds*; Sophocles' *Antigone*. C-L: Classical Studies 157S. One course. *Grant*

**151. Introduction to Latin American Politics (B).** (SS) Historical and cultural context of political institutions and behavior, the role of traditional and emerging groups and forces, political instability and the decision-making process. C-L: Comparative Area Studies and Latin American Studies. One course. *Morgenstern*

**151A. Introduction to Latin American Politics (B).** (FL, SS) Same as Political Science 151 except taught in Spanish. C-L: Comparative Area Studies and Latin American Studies. One course. *Staff*

**151D. Introduction to Latin American Politics (B).** (SS) Same as Political Science 151 except taught with two lectures and one discussion group. C-L: Comparative Area Studies and Latin American Studies. One course. *Morgenstern*

**155. The Politics and Economics of Developing Areas (B).** (SS) Process and politics of transition of rural and agrarian societies to urban and industrial societies: Soviet Union, United States, India, Africa, and Asia. C-L: Comparative Area Studies. One course. *Staff*

**156S. American Communities: A Documentary Video Approach.** (AL, SS) Prerequisites: English 101A and any one of the following: Film and Video 100S, 101S, or 104S. See C-L: Film and Video 105S; also C-L: Cultural Anthropology 134S, History 150B, and Public Policy Studies 105S. One course. *Staff*

**157D. Foreign Policy of the United States (D).** (SS) Sources of American foreign policy, containment, international economic policy, deterrence, arms control, and disarmament. Prospects for the future. Emphasis on the period since World War II. One course. *Feaver*

**158. Transnational Relations and the Politics of Interdependence (D).** (SS) The transformation of the world political economy since World War II as a result of the increased number, site, and scope of non-state actors (such as global firms and transnational social movements), and the unprecedented expansion of trade and integration of capital markets. Links between the world political economy and domestic politics. One course. *R. Keohane*

**158D. Transnational Relations and the Politics of Interdependence (D).** (SS) Same as Political Science 158 except instruction is provided in two lectures and one small discussion meeting each week. One course. *R. Keohane*

**159. Ambition and Politics (C-N).** (SS) A theoretical examination of the role of ambition in politics, including works by or on Homer, Plato, Plutarch, Machiavelli, Shakespeare, Tocqueville, Nietzsche, and Hitler. One course. *Gillespie*

**160. Contemporary Global Issues (D).** (SS) See C-L: Comparative Area Studies 109; also C-L: Cultural Anthropology 109, History 109, and Sociology 175. One course. *Staff*

**162. Human Rights in Theory and Practice (C).** (SS) The nature and value of human rights; examining some major debates over their status and meaning and assessing the role which the idea of human rights has played in changing lives, practices, and institutions. Questions considered include: whether commitments to human rights depend on a belief in moral truth; whether the idea of universal human rights makes sense in a culturally diverse world; and what forms of social action are most likely to achieve respect for human rights. C-L: Public Policy Studies 162. One course. *Kiss*

**164. Political Organizations (A).** (SS) Using classical organization theory and research on decision-making behavior of the members of political organizations to study those organizations (such as political parties, labor unions, businesses, and public bureaucracies). One course. *Brehm*

**165. Politics and Foreign Policy of Russia (B).** (SS) The Communist experience in historical perspective and of Russian democratization, economic reform, and foreign policy. C-L: Comparative Area Studies. One course. *Hough*

**166. Congress and the President (A).** (SS) Policy in the United States system of divided government representing cooperative and adversarial goals of the executive branch and the Congress. The executive branch's control of the implementation of policy, with power to make appointments to government departments and regulatory agencies. Congress's control of the purse strings, budgets of agencies, and a final say in political appointments. Features of this balance of power in policy-making; institutional and political origins of laws and regulations. One course. *Munger*

**167. International Law and International Institutions (D).** (SS) An investigation of the relationship between international politics and international law, by examining how international institutions actually operate, the significance of legal rules, issues of compliance with such rules, and the connections between international relations and domestic law. One course. *R. Keohane*

**167D. International Law and International Institutions (D).** (SS) Same as Political Science 167 except instruction is provided in two lectures and one small discussion meeting each week. One course. *R. Keohane*

**168. Analysis of Political Decision Making (C-E).** (SS) Surveys of some of the most prominent problems, methods, ideas, and findings that have emerged in recent theoretical studies of politics. Intellectual puzzles, speculative models and normative and explanatory applications, individual decision theory, game theory, and social choice theory. Not open to students who have taken Political Science 139. One course. *Niou*



**169. Chinese Politics (B).** (SS) An introduction to the Communist revolution, the structure of the political system and political decision making in the People's Republic of China, the relations between state and society, and the political implications and consequences of reforms undertaken in the post-Mao era. One course. *Shi*

**171. From Apartheid to Democracy in South Africa (B).** (SS) The South African political system in the twentieth century with particular attention to the transition from apartheid and white minority rule to nonracial democracy. C-L: African and African-American Studies 171 and Comparative Area Studies. One course. *Johns*

**172. Introduction to the Politics of the Communist System (B).** (SS) The development of the Communist Movement as a consequence of the Industrial Revolution. Marxist theories and some of the underlying structural and dynamic principles of Marxism-Leninist systems. Social, economic, and political transformations undertaken under the auspices of Stalin and Mao. Issues related to the reform of Marxist-Leninist systems. One course. *Shi*

**173S. Political Economy of World Food Problems (B).** (SS) Changing policies toward food production and distribution. Topics include American agricultural policy, international food and famine aid, and Third World agricultural development strategies. C-L: Comparative Area Studies. One course. *Johns*

**175A. Distributive Justice and the Social Sciences (C-N).** (SS) Prerequisites: Economics 1 or 51 and Economics 2 or 52. See C-L: Economics 199. One course. *Moulin*

**176A. Perspectives on Food and Hunger (B).** (SS) Analysis of hunger problems in United States and Third World countries. Focus on role of governments, nongovernmental organizations, and international agencies. Weekly lectures, discussion meetings, and individual research. C-L: Comparative Area Studies. One course. *Johns*

**176B. Perspectives on Food and Hunger (B).** (SS) Analysis of hunger problems in United States and Third World countries. Focus on role of governments, nongovernmental organizations, and international agencies. Weekly lectures, discussion meetings, and community internship project. C-L: Comparative Area Studies. One course. *Johns*

**177. American Constitutional Development I (A).** (SS) Development of the United States Constitution through Supreme Court decisions: the foundations of national power, including the separation of powers, the nature of the federal union and the relationship of the Constitution to political and economic life since 1790. C-L: History 177A. One course. *Fish*

**178. American Constitutional Development II (A).** (SS) Development of the United States Constitution through modern Supreme Court decisions: the scope of authority, liberty, and equality through interpretations of the Bill of Rights and the Fourteenth Amendment. One course. *Fish*

**179. Ecological Crisis and Political Theory (C-N).** (SS) Interconnections between various dimensions of the ecological crisis including: conceptions of self, nature, ecological ethics, and environmental justice as related to politics, economics, and new social movements. One course. *Coles*

**180. Media in Comparative Perspective (B).** (SS) See C-L: Sociology 182; also C-L: Canadian Studies, Comparative Area Studies, and Film and Video. One course. *Staff*

**182. Classical Political Philosophy (C-N).** (CZ) Ancient theories of the way of life and the political regime best suited to promote happiness in human communities. Readings from the Greek sophists, Aristophanes, Plato, Aristotle, the academic skeptics, Stoics, and Cicero. Prerequisites: junior standing; open to sophomores by consent of instructor. One course. *Staff*



**183S. Democracy and Social Choice (B). (SS)** Basic questions about the impact of political institutions in democratic states. Topics include electoral systems, representative districting, the timing of elections, executive responsibility in presidential and parliamentary systems, the structure of the legislature, party formation, coalition building, term limits. Different theories of social choice; empirical comparisons of politics in countries with different democratic institutions. One course. *Niou*

**184S. Canadian Issues (B). (SS)** Prerequisite: Canadian Studies 98 or consent of instructor. See C-L: Canadian Studies 184S; also C-L: Comparative Area Studies, Cultural Anthropology 184S, Economics 184S, History 184S, and Sociology 184S. One course. *Staff*

**185S. The Canadian Health Care System (B). (SS)** See C-L: Canadian Studies 185S; also C-L: Comparative Area Studies, Cultural Anthropology 185S, Economics 185S, History 108E, Public Policy Studies 187S, and Sociology 185S. One course. *Warren*

**189, 190. Internship (A).** Open to students engaging in practical or governmental work experience during the summer or a regular semester. A faculty member in the department will supervise a program of study related to the work experience, including a substantive paper on a politics-related topic, containing significant analysis and interpretation. Consent of director of undergraduate studies required. One course each. *Staff*

**191, 192. Independent Study (A, B, C, D).** Directed reading and/or research resulting in a substantive paper or report containing significant analysis and interpretation on a politics-related topic, under the supervision of a faculty member. Open only to qualified juniors by consent of the director of undergraduate studies and of the supervising instructor. One course each. *Staff*

**193, 194. Independent Study (A, B, C, D).** Directed reading and/or research resulting in a substantive paper or report containing significant analysis and interpretation on a politics-related topic, under the supervision of a faculty member. Open only to seniors by consent of the director of undergraduate studies and of the supervising instructor. One course each. *Staff*

**196. American University Washington Semester (A, D).** This number represents transfer credit for American Government and Politics or International Relations topics courses taken at American University in the fall or spring Washington Semester Program: Seminar I (one course), Seminar II (one course), Research Project (one course), Internship (one course). Prior approval for admission into this program must be obtained from the director of undergraduate studies in political science. Four transfer credits.

A. Programs in American Government and Politics

D. Programs in International Relations

Four courses.

**197S. Dealing with the Past in Democratic Transitions (B). (SS)** How do newly democratic societies confront their authoritarian pasts, often marked by civil strife, in many cases ethnically, racially, and class based? Comparison of postwar Western European countries and Japan with recent transitions in Africa, Eastern Europe, and Latin America. One course. *Johns*

**198. Documentary Film History (B). (AL, CZ)** See C-L: History 150A; also C-L: Film and Video, Literature 117, and Perspectives on Marxism and Society. One course. *Gaines, Paletz, or Wood*

**199. Special Topics in Government and Politics. (SS)** Topics vary from semester to semester.

A. American Government and Politics

B. Comparative Government and Politics

C. Political Theory  
D. International Relations  
One course. *Staff*

## FOR SENIORS ONLY

**200H. Senior Honors Program (A, B, C, D). (SS)** Two-course, year-long sequence.

Fall: Senior Thesis Design, Research, Writing; One course.

Spring: Thesis Writing and Defense; One course.

Consent of instructor required. One course. *Staff*

**200S. Senior Seminars. (SS)** Special topics courses; open also, if places are available, to qualified juniors who have earned a 3.0 average and obtain the consent of the instructor.

A. American Government and Politics

B. Comparative Government and Politics

C. Political Theory

D. International Relations

One course. *Staff*

## FOR SENIORS AND GRADUATES

The following courses may be taken by juniors who have earned a 3.0 average and obtained the consent of the instructor.

**201S. Problems in International Security (D). (SS)** Major security issues. Prerequisite: a course in international relations or American foreign policy. One course. *Staff*

**203S. Issues in Politics and the Media in the United States (A). (SS)** Research seminar analyzing significant questions in the relationship between politics and the media of communication. Consent of instructor required. C-L: Canadian Studies, Comparative Area Studies, and Film and Video. One course. *Paletz*

**205S. The Political Economy of Environmental Resources (B). (SS)** The rational choice tradition (public goods, collective action, game theory, property rights, new institutionalism) as applied to environmental problems, resource exploitation, environmental justice, and the design of an environmentally sound society. One course. *McKean*

**206S. Political Participation: Comparative Perspectives. (SS)** The study of political participation through development of an understanding of relevant research methods. The effects of political culture on political participation. Popular participation and mobilization systems in liberal democracies and developing countries. One course. *Shi*

**207S. American Constitutional Interpretation (A). (SS)** U.S. Supreme Court interpretation of selected provisions of the Constitution. Prerequisites: Political Science 127 or 177 or 178 and consent of instructor. One course. *Fish*

**209. Problems in State Government and Politics (A). (SS)** One course. *Staff*

**210S. Politics and Markets in Modern Capitalism (D). (SS)** Exploration, through classic works and contemporary analyses, of the relationship between representative democracy and markets in modern capitalist society, with special attention to the impact of the world political economy on democracy and capitalism. One course. *R. Keohane*

**212S. Politics and Markets (D). (SS)** Seminar on classics of political economy, exploring the relationship between economic markets and politics as treated in the works of Adam Smith, Marx, Polanyi, Schumpeter, Lindblom, and Hirsch, as well as contemporary works on globalization and its effects on domestic politics. Open only to seniors and graduate students. One course. *R. Keohane*

**213S. Theories of International Political Economy (D).** (SS) Comparison and assessment of traditional and modern theories in terms of their logical and empirical validity. One course. *Grieco*

**216S. Evolution of European Marxism (C-N).** (SS) The central themes in the evolution of European Marxism: socialist thought prior to Marx; the writings of Marx and Engels. The themes are articulated in: Russian Marxism; Soviet Communism and its Marxist critics; the rethinking of Marx's political economy, the theory of the state, and concepts of class consciousness in the works of twentieth-century European Marxists. C-L: Comparative Area Studies. One course. *Coles*

**217. Comparative and Historical Methods (B).** (SS) See C-L: Sociology 214; also C-L: Comparative Area Studies. One course. *Gereffi, Lin, or Tiryakian*

**218. Political Thought in the United States (C-N).** (SS) American political thought through the Civil War period. The Founders and their European antecedents. Debates over the Constitution, slavery, and the Union. One course. *Gillespie or Grant*

**220S. Problems in International Politics (D).** (SS) Prerequisite: one course in international relations, foreign policy, or diplomatic history. One course. *Staff*

**222. Introduction to Statistical Analysis (C-E).** (QR) Basic applications of statistical theory to political questions: research design, hypothesis tests, computer data analysis. Consent of instructor required for undergraduates. One course. *Brehm or Gronke*

**223. Ancient Political Philosophy (C-N).** (SS) Intensive analysis of the political philosophy of Plato, Aristotle, and other ancient theorists. C-L: Classical Studies 203. One course. *Gillespie or Grant*

**224S. Modern Political Theory (C-N).** (SS) A historical survey and philosophical analysis of political theory from the beginning of the seventeenth to the middle of the nineteenth century. The rise of liberalism, the Age of Enlightenment, the romantic and conservative reaction, idealism, and utilitarianism. One course. *Grant or Spragens*

**225. Topics in Comparative Government and Politics: Western Europe (B).** (SS) Topics vary: the development of mass democracy and the welfare state; political and electoral participation and mobilization; social movements and political change; center-periphery conflicts; government and bureaucratic institutions and their relationships to society; the modern welfare state and political economy. C-L: Comparative Area Studies. One course. *Kitschelt or Lange*

**227S. Issues in International Communications (B).** (SS) Research seminar analyzing selected political issues in international communications. C-L: Film and Video. One course. *Paletz*

**228S. Nineteenth- and Twentieth-Century Political Philosophy (C-N).** (SS) Topics in nineteenth- and twentieth-century political philosophy, considering such authors as Hegel, Marx, Nietzsche, Kant, Fichte, Dostoevsky, and Heidegger. One course. *Coles or Gillespie*

**229S. Contemporary Theory of Liberal Democracy (C-N).** (SS) One course. *Spragens*

**230S. Introduction to Positive Political Theory (C-E).** (SS) Basic concepts of political economy, theory of preference and choice, social choice theory, and decision and game theory. One course. *Aldrich or Niou*

**231S. Crisis, Choice, and Change in Advanced Democratic States (B).** (SS) Contributions of Marx, Weber, and Durkheim toward analysis of modern democracies. Examination of

selected contemporary studies using these three perspectives to highlight processes of change and crisis. Unsettling effects of markets upon political systems, consequences of bureaucratic regulation, and transformation of sources of solidarity and integration in modern politics. C-L: Comparative Area Studies. One course. *Kitschelt*

**232. Political Economy: Theory and Applications (C-E). (SS)** Selected topics. C-L: Comparative Area Studies. One course. *Lange*

**234S. Political Economy of Development: Theories of Change in the Third World (B). (SS)** Alternative approaches to political economy and social change in the Third World. C-L: Comparative Area Studies, Cultural Anthropology 234S, History 234S, and Sociology 234S. One course. *Staff*

**236S. Hegel's Political Philosophy (C-N). (SS)** Within context of Hegel's total philosophy, an examination of his understanding of phenomenology and the phenomenological basis of political institutions and his understanding of Greek and Christian political life. Selections from *Phenomenology*, *Philosophy of History*, and *Philosophy of Right*. One course. *Gillespie*

**238S. Development of United States Courts of the Fourth Circuit (A). (SS)** Examines judges, courts, and law of United States district and old circuit courts and Court of Appeals: Maryland, Virginia, West Virginia, North Carolina, South Carolina, 1789-1958. Consent of instructor required. C-L: History 255A and Law 548S. One course. *Fish*

**240. American Political Behavior (A). (SS)** One course. *Staff*

**247. Politics and Philosophy of Self and Other (C-N). (SS)** Epistemological, ontological, ethical, and political dimensions of relations between self and other. Theorists may include Husserl, Merleau-Ponty, Levinas, Derrida, Adorno, Gadamer, Sartre, Foucault, and Bakhtin. One course. *Coles*

**250S. International Security after the Cold War (D). (SS)** Contemporary issues in international security: nuclear proliferation, balance of power, the role of force, alternative viewpoints. Consent of instructor required. One course. *Feaver*

**253S. Comparative Government and the Study of Latin America (B). (SS)** Current literature on major themes of Latin American politics. C-L: Comparative Area Studies and Latin American Studies. One course. *Morgenstern*

**254S. Essential Global Democracy (A). (SS)** The failure and success in establishing real democracy, including focus on the main leaders. Issues of law, rights, equality, representation, reasoning, and other principles addressed in the context of practical politics. One course. *Staff*

**256S. Theory and Practice of National Security (D). (SS)** In-depth look at the theoretical and empirical literature explaining how states seek to guarantee their national security. Topics include: grand strategy, nuclear deterrence and warfighting, coercive diplomacy, military intervention, decisions for war, and civil-military relations. Special attention paid to U.S. national security during and after the Cold War. One course. *Feaver*

**266. Comparative Social Policy (B). (SS)** See C-L: Public Policy Studies 266; also C-L: Canadian Studies, and Comparative Area Studies. One course. *Staff*

**268S. The Regulatory Process (A). (SS)** See C-L: Public Policy Studies 269S. One course. *Hamilton*

**271. International Environmental Regimes (B). (SS)** Law, politics, and institutional design of international regimes created among nations to cope with environmental problems. Includes study of particular conventions and treaties (for example, acid rain, ozone, carbon



reduction, biodiversity, Antarctica, regional seas, ocean dumping), and the environmental implications of international trade rules and regimes (for example, GATT). C-L: Comparative Area Studies and Public Policy Studies 258. One course. *McKean*

**272. China and the World (D).** (SS) The formulation and development of Chinese foreign relations and foreign policy since 1949. One course. *Shi*

**273S. Heidegger (C-N).** (CZ, SS) An examination of the philosophy of Martin Heidegger from its phenomenological beginnings to its postmodernist conclusions with particular attention to its meaning for questions of identity, history, nihilism, technology, and politics. C-L: Philosophy 273S. One course. *Gillespie*

**274S. Seminar in Urban Politics and Urban Public Policy (A).** (SS) A probing of topical issues in both their theoretical antecedents and their contemporary manifestations. The intellectual debates and scholarly treatments surrounding issues of power in the city, urban redevelopment policy, urban poverty, and race in the city. C-L: Public Policy Studies 275S. One course. *Orr*

**275. The American Party System (A).** (SS) An intensive examination of selected facets of American national political parties, such as relationships between presidential and congressional politics, the politics of national conventions, recent foreign policy and party alignments, and the controversy over party government. One course. *Staff*

**276S. Media and Democratization in Russia (B).** (SS) See C-L: Public Policy Studies 243S. One course. *Mickiewicz*

**277. Comparative Party Politics (B).** (SS) The impact of social and political systems on party structures, functions, ideologies, and leadership recruitment. Emphasis upon research techniques and objectives. C-L: Canadian Studies and Comparative Area Studies. One course. *Lange*

**278S. Black Political Participation (A).** (SS) Topical issues concerning the political participation of African Americans, primarily on the national level. Black voter turnout, the electoral choice, the role of African Americans in the Democratic and Republican parties, black interest group politics, black political opinion, and black political socialization. C-L: African and African-American Studies 278S. One course. *Orr*

**281. American Political Thought Since the Gilded Age (C-N).** (SS) The development of American political thought since the late nineteenth century. Special emphasis on the Progressive era and on modern-day attempts to reconstruct theories of liberalism and democracy. One course. *Staff*

**282S. Canada (B).** (SS) See C-L: Canadian Studies 282S; also C-L: Comparative Area Studies, Cultural Anthropology 282S, Economics 282S, History 282S, and Sociology 282S. One course. *Staff*

**283S. Congressional Policy-Making (A).** (SS) Lawmaking and oversight of the executive branch by the U.S. Congress. Committee, party, executive, and interest group roles. C-L: Public Policy Studies 283S. One course. *Gronke*

**284S. Public Policy Process in Developing Countries (B).** (SS) See C-L: Public Policy Studies 284S; also C-L: Comparative Area Studies, and Latin American Studies. One course. *Ascher*

**285S. Seminar in North American Studies.** (CZ) See C-L: North American Studies 283S; also C-L: Cultural Anthropology 283S, History 283S, Public Policy Studies 282S, Romance Studies 283S, and Sociology 283S. One course. *Staff*

286. **Theory and Practice of International Security (D).** (SS) Analyses and criticism of the current theoretical, empirical, statistical, and case study literature on international security. No prerequisite, but Political Science 93 recommended. One course. *Goemans*

287. **Revolution, Reform, and Democratization (B).** (SS) A comparison of revolution and democratization in the United States, Western Europe, and Russia with that in the contemporary Third World. One course. *Hough*

288. **War and the National State (D).** (SS) Transformation of warfare by selected socio-economic and technological revolutions and its impact on international relations, 1800-1945. No prerequisite, but Political Science 93 recommended. C-L: History 255B. One course. *Goemans*

289S. **Contemporary Ethical Theories (C-N).** (CZ, SS) Consent of instructor required. See C-L: Philosophy 203S; also C-L: Women's Studies. One course. *Flanagan, Golding, or MacIntyre*

291. **Research Methods in Japanese.** (SS) Consent of instructor required. See C-L: Japanese 291; also C-L: Cultural Anthropology 290, History 292, and Sociology 291. One course. *Staff*

299. **Advanced Topics in Government and Politics.** (SS) Topics vary from semester to semester.

- A. American Government and Politics
  - B. Comparative Government and Politics
  - C. Political Theory
  - D. International Relations
- One course. *Staff*

## COURSES CURRENTLY UNSCHEDULED

- 100C. Duke Summer Program: Zimbabwe/Botswana. (SS)
- 101A, S. Issues in Twentieth-Century American Political Practice (A). (SS)
- 102. Comparative Analysis of Democratic Institutions (B). (SS)
- 109. State and Local Government Today (A). (SS)
- 112S. Shaping the News (A). (SS)
- 114. Public Opinion (A). (SS)
- 121. International Organization (D). (SS)
- 124. National Economic Statecraft (D). (SS)
- 129. Political Participation (A). (SS)
- 132. Politics of Asia (B). (SS)
- 134. Legislative and Party Systems in Western Democracies (B). (SS)
- 135. Political Development of Western Europe (B). (SS)
- 144. Force and Statecraft (D). (SS)
- 149. United States and East Asia (D). (SS)
- 152. Political Mobilization of the American Public (A). (SS)
- 153, 154. Politics and the Media of Mass Communication 153 (B), 154 (A). (SS)
- 161S. Comparative Government and Politics: Africa (B). (SS)
- 170. Europe Transformed (D). (SS)
- 174S. Political Biography (A). (SS)
- 181. Marxism and Neo-Marxism (C-N). (SS)
- 186. Political Leadership (A). (SS)
- 187S. Politics and the Libido (A). (SS)
- 188. The Psychology of Political Symbols (A). (SS)
- 195. Comparative Political Behavior in the United States and Canada (B). (SS)
- 202. American Foreign Economic Policy (D). (SS)
- 204S. Ethics in Political Life (C-N). (SS)
- 208S. Analyzing the News (A). (SS)

211S. Current Problems and Issues in Japanese Politics (B). (SS)  
 219S. Film and Politics (A). (SS)  
 221S. International Institutions and the World Political Economy (D). (SS)  
 233. Intermediate Statistical Methods (C-E). (QR)  
 235S. Comparative Development of Islam (B). (SS)  
 239. Comparative History and International Relations (D). (SS)  
 243S. Political Applications of Game Theory (C-E). (SS)  
 244S. The Politics of the European Community (D). (SS)  
 246S. Political Hypocrisy and Idealism (C-N). (SS)  
 249. The Politics of Health Care (A). (SS)  
 251S. The American Presidency (A). (SS)  
 252S. The Nation-State and the International System (D). (SS)  
 257S. Making American Defense Policy (D). (SS)  
 258. Global Interdependence (B). (SS)  
 260S. The Tradition of Political Inquiry (C-N). (SS)  
 262S. Transitions from Classic Communism (B). (SS)  
 265S. The Process of International Negotiation (D). (SS)  
 267S. Policy-Making in International Organizations (D). (SS)  
 269S. War and Wealth in the International System (D). (SS)  
 270S. Fundamentals of Political Economy (C-E). (SS)  
 279S. Political Protest and Collective Mobilization (B). (SS)  
 293. Federalism (B). (SS)

## POLITICAL INTERNSHIPS

The department administers an internship program, primarily in Washington, D.C., for political science majors and interested nonmajors. Students participate by qualifying for a position obtained by the department or by acquiring their own relevant employment, with or without compensation. Course credit can be obtained by enrolling in Political Science 189 or 190 and writing a substantive paper containing significant analysis and interpretation on a politics-related topic. Potential applicants should contact the internship director, (404 Perkins), at any time, but preferably in the fall semester.

## POLITICAL SCIENCE COURSES BY FIELDS

Political science courses for undergraduates are offered in four fields. The courses in each of the four fields are listed below; in the course descriptions above, the field in which each course falls is indicated by the appropriate symbol (A, B, C-N/C-E, or D). Students majoring in the department must complete at least one course in each of three fields.

American Government and Politics (A). Political Science 20S\*, 49S\*, 60S\*, 91, 91D, 100K, 101A,S, 103A, 103B, 108, 109, 110, 112S, 127, 128, 129, 130S, 137, 141, 143, 145, 146D, 152, 154, 164, 166, 174, 177, 178, 186, 187S, 188, 189\*, 190\*, 191\*, 192\*, 193\*, 194\*, 196A, 199A, 200A,S, 200H\*, 203S, 207S, 208S, 209, 219S, 238S, 240, 249, 251S, 254, 268, 274, 278, 283S, 299A.

Comparative Government and Politics (B). Political Science 20S\*, 49S\*, 60S\*, 92, 92D, 98, 100A, 100C, 100E, 100K, 100L, 100M, 100Q, 102, 105, 107, 111, 115, 117, 119, 125, 132, 135, 136, 136D, 147, 151, 153, 155, 161S, 162, 165, 169, 171, 172, 173S, 176A, 176B, 180, 183, 184S, 185, 191\*, 192\*, 193\*, 194\*, 198, 199B, 200B,S, 200H\*, 205S, 211S, 217, 225, 231S, 234S, 235S, 253S, 258, 262S, 266S, 271, 276S, 277, 279S, 282S, 284S, 287, 291, 293, 299B.

Political Theory: Normative (C-N). Political Science 20S\*, 49S\*, 60S\*, 94, 94D, 101C,S, 104, 123, 126, 131, 140, 150, 159, 175A, 179, 181, 182, 191\*, 192\*, 193\*, 194\*, 199C-N, 200C-N, 200H\*, 204S, 216S, 218, 223, 224S, 228S, 229S, 246, 247, 260S, 264S, 273, 281, 289, 299C-N. Empirical and Methodology (C-E). Political Science 138, 138D, 139, 168, 191\*, 192\*, 193\*, 194\*, 199C-E, 200C-E,S, 200H\*, 222, 230S, 232, 233, 243, 270S, 285, 299C-E.

International Relations, Law, and Politics (D). Political Science 20S\*, 49S\*, 60S\*, 93, 93D, 100C, 106, 106D, 113A, 113B, 116S, 118, 120, 121, 122, 124, 133, 134, 139, 142, 144, 148D, 149, 150, 156, 157, 157D, 158,

160, 167, 170, 191\*, 192\*, 193\*, 194\*, 196D, 199D, 200D.S, 200H\*, 201S, 202, 206, 210S, 212S, 213S, 220S, 221S, 244, 252, 256S, 257S, 265S, 267S, 269, 272, 286, 288, 299D.

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\*If subject matter is appropriate to the field.

## THE MAJOR

*Major Requirements.* Ten courses in political science, at least eight of which must be at or above the 100 level. Among the ten courses taken must be at least one course in each of three fields and at least one course taken at Duke at the 200-299 level. The department also requires that each major select one area of concentration.

An area of concentration is defined as five courses, at least one of which must be at the 200 level. The twelve areas of concentration and the courses that qualify for each area are listed below. It should be noted that many courses are listed under more than a single area of concentration. All majors are required to select a concentration in consultation with their advisor; majors are strongly encouraged to make their selection by the end of the first semester of their junior year.

All courses currently being offered by the department are listed under one or more areas of concentration, but this list does not include courses that may be offered by visiting faculty, courses taken abroad, courses transferred from other universities, or courses that may have content that varies from year to year. More specifically, the following types of courses are not included in these lists:

- PS 20S First-year seminars
- PS 49S First-year seminars
- PS 60S Introductory Seminars in Political Science
- PS 100 Duke study abroad programs
- PS 189, 190 Internship credit
- PS 191-194 Independent Study
- PS 196 Washington Semester Program
- PS 200A-D Senior Seminars

Students taking such a course should consult with their advisors to determine in which sequence it will be assigned. The same procedure will apply to courses taught on a one-time basis by visiting faculty.

## Areas of Concentration

### *American Institutions and Public Policy*

- Introductory—20S\*, 49S, 60S\*, 91, 101A
- 100-Level—103A, 103B, 108, 109, 110, 127, 128, 130S, 131, 141, 145, 146D, 154, 156S, 157D, 164, 166, 187S, 189\*, 190\*, 191\*, 192\*, 193\*, 194\*, 196A, 199A\*
- 200-Level—200A\*, 200H\*, 203S, 207S, 208S, 209, 218, 230, 251, 257, 268, 274S, 275, 278S, 283S, 293, 299A\*

### *Public Opinion, Campaigns, and Elections*

- Introductory—20S\*, 49S\*, 60S\*, 91
- 100-Level—110, 114, 129, 131, 137D, 152, 154, 188, 189\*, 190\*, 191\*, 192\*, 193\*, 194\*, 199A\*
- 200-Level—200A\*, 200H\*, 203S, 208S, 219S, 240, 275

### *Philosophical and Legal Foundations of American Politics*

- Introductory—20S\*, 49S\*, 60S\*, 91
- 100-Level—126, 127, 131, 146D, 177, 178, 191\*, 192\*, 193\*, 194\*, 199A, 199C-N\*
- 200-Level—200A\*, 200H\*, 207S, 218, 229S, 238S, 254, 299A, 299C-N



### *Comparative Democracies†*

Introductory—20S\*, 49S\*, 60S\*, 91, 92, 98

100-Level—102, 110, 111, 114, 115, 117, 119, 126, 134, 135, 136, 137, 139, 151, 153, 164, 171, 174S, 180, 184S, 186, 191\*, 192\*, 193\*, 194\*, 195, 197S, 199B\*

200-Level—200A\*, 200B\*, 200H\*, 211S, 219S, 225, 231, 240, 253, 254, 275, 276S, 277, 279S, 282S, 287, 291, 293, 299B\*

### *Comparative and International Political Economy*

Introductory—20S\*, 49S\*, 60S\*, 92, 93

100-Level—107, 113A, 113B, 116S, 122, 125, 136D, 139, 147, 155, 158, 164, 170, 172, 173S, 176A, 176B, 191\*, 192\*, 193\*, 194\*, 199B

200-Level—200B\*, 200D\*, 200H\*, 205S, 210S, 213S, 218, 221, 232, 243S, 244S, 270S, 271, 299B

### *Politics of Socialist and Capitalist Development*

Introductory—20S\*, 49S\*, 60S\*, 92

100-Level—101B, 105, 117, 132, 149, 151, 155, 161S, 165, 171, 173S, 176A, 176B, 191\*, 192\*, 193\*, 194\*, 199B\*

200-Level—200B\*, 200H\*, 234S, 253S, 262S, 267S, 284S, 287, 299B

### *International Security*

Introductory—20S\*, 49S\*, 60S\*, 93

100-Level—106D, 120, 122, 142, 144, 157D, 167D, 191\*, 192\*, 193\*, 194\*, 199D\*

200-Level—200D\*, 200H\*, 201S, 250S, 256S, 257S, 286, 288, 299D

### *Problems and Issues in Contemporary International Relations*

Introductory—20S\*, 49S\*, 60S\*, 93

100-Level—116, 120, 121, 122, 147, 160, 162, 191\*, 192\*, 193\*, 194\*, 199D\*

200-Level—200D\*, 200H\*, 201S, 205S, 220S, 227S, 252S, 299D

### *Comparative Foreign Policy Analysis*

Introductory—20S\*, 49S\*, 60S\*, 93

100-Level—118, 124, 133, 149, 157D, 191\*, 192\*, 193\*, 194\*, 199D\*

200-Level—200D\*, 200H\*, 202, 272, 299D\*

### *International Political Economy*

(see Comparative and International Political Economy)

### *Political Theory*

Introductory—20S\*, 49S\*, 60S\*, 94, 123

100-Level—101C, 104, 123, 126, 131, 140, 150, 159, 162, 175A, 179, 181, 182, 183, 191\*, 192\*, 193\*, 194\*, 199C-N\*

200-Level—200C-N\*, 200H\*, 204S, 216S, 218, 223, 224S, 228S, 229S, 236S, 246S, 247, 254, 260S, 289S, 299C-N

### *Research Methods*

Introductory—49S\*, 60S\*, 139

100-Level—125, 138, 145, 164, 168, 175A, 191\*, 192\*, 193\*, 194\*, 199C-E\*

200-Level—200H\*, 205S, 230S, 232, 243S, 270, 299C-E

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\*If subject matter is appropriate to the field.

†Students selecting this sequence must select at least two courses that deal with non-North American political systems.

Of the ten required political science courses, at least eight must be taken at Duke to meet major requirements. However, only seven political science courses need be taken at Duke if the student: (1) is transferring courses from a year-long approved study abroad program; or (2) transferred to Duke after completing two undergraduate years at another institution; or (3) completed one semester at an approved study abroad program and one semester in the Washington Semester Program at American University. For the purpose of this requirement courses in the Washington Semester Program at American University (Political Science 196, A, D) will be counted as transfer courses.

**Advanced Placement Credit.** Advanced placement credits in political science (score of 4 or 5). These course credits are designated as Political Science 90A (American Government and Politics) and Political Science 90B (Comparative Government and Politics). Such credits are applied toward the thirty-four credits needed for graduation and enable students to enroll in any 90-level introductory course(s) and permit them to enroll in advanced American and/or Comparative Government course(s). Advanced placement course credits (90A, 90B) do not satisfy course requirements for the political science major.

**Suggested Work in Related Disciplines.** Selected courses in such disciplines as anthropology, economics, history, philosophy, psychology, public policy, religion, and sociology are desirable.

### **Graduation with Distinction**

The department offers students majoring in political science a senior honors program, by successful completion of which a participant achieves graduation with distinction in political science. The central requirement of the program is an honors thesis which the student prepares under faculty supervision. The honors program consists of two courses (Political Science 200H.02 and 200H.03). Seniors entering their seventh semester who have attained at least a 3.3 grade point average overall and a 3.5 average in political science courses are eligible for admission to Political Science 200H.02. Upon request, the instructor may recommend admission to the honors seminar of a student who lacks one or both requisite grade point averages. The program director must approve any recommended student's admission.

Political Science 200H.02, a seminar usually taken in the fall of the senior year, is devoted to development of the honors thesis and includes close supervision of the writing stage of the project by a faculty supervisor selected by the student. Continued close faculty supervision of the project occurs in Political Science 200H.03, which is an independent study course.

Completion of the thesis, its evaluation, and its defense before a three-member faculty committee warrants graduation with distinction in political science if a grade of A- or better is assigned to the student's thesis and performance in Political Science 200H.02 and 200H.03. The intradepartmental concentration option is partially satisfied by successful completion of the two-course senior honors thesis seminar. Further information may be obtained from the honors program director or from the director of undergraduate studies.

### **THE MINOR**

*Requirements.* A minimum of five courses in political science, no more than two of which may be numbered less than 100.

## **Primatology (PRI)**

Professor Glander, *Director*

A certificate, but not a major, is available in this program.

Interest in human evolution has surged in recent years because of some startling fossil discoveries and the rapid development of a strong theoretical base for the study of primate behavior and ecology. The anatomy of living and fossil primates can be interpreted only on

the basis of the behavior and ecology of living primates. The Department of Biological Anthropology and Anatomy and the Duke University Primate Center contain collections of specimens of both extant and fossil nonhuman primates. The Primate Center provides a further and unique opportunity to study fossil specimens and living primates simultaneously.

The goal of the program is to understand the behavior and biology of primates, including humans. Program objectives include an understanding of the origin and evolution of humans as well as their morphological and behavioral relationships to other primates. The study of primate evolution involves such diverse areas of investigation as morphology, social behavior, ecology, and physiology. A cross-disciplinary approach employing the faculty of the Duke Primate Center and the Departments of Biological Anthropology and Anatomy, Philosophy, Psychology, Zoology, and the Nicholas School of the Environment provides the opportunity for linking of these parts of the University in order to concentrate on a topic which has become too large for one perspective or one discipline.

The curriculum includes six courses, all of which must be completed to receive the program certificate:

*Three required courses:* Biological Anthropology and Anatomy 93D (Introduction to Physical Anthropology), Primatology 186S (Research Internship), and Primatology 187S (Senior Seminar).

*Three elective courses* chosen from the recommended list published annually in the program brochure; one of these courses must be drawn from among those not originating in Biological Anthropology and Anatomy.

The Research Internship and Senior Seminar arranged through the program are available only to students seeking the program certificate. Other components of the program are available to all undergraduates.

## PRIMATOLOGY COURSES (PRI)

**186S. Research Internship in Primatology.** (NS) Part of the Undergraduate Program in Primatology. Supervised work either in a laboratory or at the Primate Center. Consent of instructor required. One course. *Glander or White*

**187S. Senior Seminar in Primatology.** (NS) Part of the Undergraduate Program in Primatology. Consent of instructor required. One course. *Glander or White*

## Psychology (PSY)

Professor R. Erickson and Associate Professor Putallaz, *Co-Directors of Undergraduate Studies*; Professors Bettman, Blumenthal, Brodie, Carson, Coie, Costanzo (*Chair: Social and Health Sciences*), Eckerman, C. Erickson, Flanagan, George, Glenbe, W. G. Hall, Hamilton, Hasher, Holland, Lochman, Lockhead, McLoyd, Payne, Purves, Roth, Rubin, Sheppard, Spenner, Staddon, Surwit, Thompson, M. Wallach, and R. Williams; Associate Professors Anderson, Curry, Day, Kuhn, Linville, Logue, Marsh, Mazuka, Meck, Nowicki, Quinn, Robins, Schmajuk, Siegler, Wells, and C. Williams (*Chair: Experimental*); Assistant Professors Curran, Fischer, Gustafson, Hill, March, Needham, Serra; Professors Emeriti Alexander, Borstelmann, Kimble, Kremen, Lakin, H. Schiffman, and Wing; Research Professors Crovitz, Goldstein, W. C. Hall, S. Schiffman, and L. Wallach; Associate Research Professor Madden; Assistant Research Professors Higa and Welsh; Adjunct Professor Gottlieb; Associate Adjunct Professor Swartzwelder; Assistant Adjunct Professor Stocking; Research Scholar Fairbank

A major or minor is available in this department.

The *General Courses*, coded (G), do not count towards an area of concentration, but do count towards the major. The *Biological Bases of Behavior* area, coded (B), includes courses on

the nervous system, the learning process, motivation, neurochemistry, hormones, and other biological factors in their relationship to behavior. The *Cognitive Psychology* area, coded (C), includes the topics of sensation and perception, cognition, learning, language, memory, and psycholinguistics. *Developmental Psychology*, coded (D), emphasizes the developmental aspects of all psychological processes such as sensory and motor behavior, cognition, children's thinking and reasoning, and social behavior. Courses in the *Personality/Social Psychology* area, coded (P), ultimately bear on the questions of human character and behavior, both normal and abnormal. These include personality, social and abnormal issues, along with strategies for the prevention of deviance. Dr. Pullataz has primary responsibility for the developmental and personality/social areas of the major, and Dr. R. Erickson has primary responsibility for the biological and cognitive areas.

**11. Introductory Psychology (G). (SS)** Biological bases of behavior, psychological development, cognitive psychology, personality, abnormal behavior, and social psychology. Designed as a broad introduction to psychology for nonmajors as well as majors; not required for the major. Students are expected to participate as subjects in three to six hours of psychological research. One course. *W. G. Hall, Holland, or H. Schiffman*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**91. Biological Bases of Behavior: Introduction and Survey (B). (NS)** Physiological, developmental, and evolutionary approaches to behavior. Sensory and cognitive processes, sleep, pain, emotion, hunger, and thirst as well as maternal and sexual behavior patterns. Students required to participate as subjects in three to six hours of psychological research if not done in a previous introductory class. Prerequisite: Biology 19 or Biology 25L; may be taken concurrently. C-L: Neurosciences. One course. *C. Erickson or C. Williams*

**92. Cognitive Psychology: Introduction and Survey (C). (SS)** Overview of cognitive processes including pattern recognition, concept formation, attention, memory, imagery, language, problem solving, and thinking. Emphasis both empirical and theoretical. Students required to participate as subjects in three to six hours of psychological research if not done in a previous introductory class. Not open to students who have taken Psychology 107. C-L: Linguistics. One course. *Day, Hasher, Rubin, or Serra*

**97. Developmental Psychology: Introduction and Survey (D). (SS)** Theory and research on growth and behavior from infancy to adolescence. Students required to participate as subjects in three to six hours of psychological research. Not open to students who have taken Psychology 105. One course. *Hill, Needham, or Putallaz*

**99. Personality and Social Behavior: Introduction and Survey (P). (SS)** The determinants of socially significant human behavior—those residing in the person, those that are the product of interpersonal context, and those resulting from the interaction of both sources. Formative as well as contemporary influences considered. Students participate in three to six hours of psychological research if not done in a previous introductory class. Not open to students who have taken Psychology 108. One course. *Costanzo or Fischer*

**100A, S. Behavior, Evolution, and Society (B). (NS)** An interdisciplinary exploration of behavioral psychology, Darwinian evolution, and the nature of society. Special topics include the history and tenets of behaviorism, experimental techniques in behavioral psychology, the IQ controversy, evolutionary epistemology, and pragmatic philosophy. Open only to students in the FOCUS Program. One course. *Higa*

**100B, S. Mind, Brain, and Cognition (B, C). (SS)** How humans function in a complex world given their biology and their experience. Perceptual and memory systems used as examples to examine how psychologists study the mind and integrate their findings with insights from anthropology, biology, and philosophy. Open only to students in the FOCUS Program. One course. *Rubin*



**101. Research Methods in Psychological Science (G).** (SS, NS) A systematic approach to the problem of designing and conducting psychological research putting that research into a larger scientific context featuring both experimental and nonexperimental methods, including observational, archival, and case-study methods. Problems of validity and control. Analysis of theorizing coupled with examination of psychological constructs used in behavioral neuroscience, cognitive science, developmental psychology, sensation and perception, as well as psychological aspects of the social and health sciences. Prerequisite: one prior course in psychology. One course. *Meck*

**103. B,C,D,P. Practicum.** Introduction to the research of a faculty member, often preparing the student for Independent Study. Format varies, including readings, data collection and analysis, discussions, or other activities. Term paper required in the form of an Independent Study proposal using the department form for this purpose; does not oblige the student to take the Independent Study. Register by designated suffix. Consent of instructor required. Pass/fail grading only. Half course. *Staff*

**104. Intelligence (C, D, P).** (SS) Issues include alternative definitions of intelligence, history of intelligence testing, basic principles of psychological tests and measurements, hereditarian views of intelligence, critique of hereditarian views, environmentalist views of intelligence, critique of environmentalist views, current perspectives on the nature vs. nurture controversy, "The Bell Curve" and its critics, and alternatives to the psychometric approach to intelligence and intellectual development. Prerequisites: Psychology 11 or 97 and Statistics 110 or equivalent. One course. *Goldstein*

**106. The Psychology of Women (P).** (SS) The psychology of women in this country: development, including sex differences, separation and individuation, and achievement; sexuality; sex-roles; mental health problems particularly salient to women; cultural influences on female development; and views within the field of psychology about women. C-L: Women's Studies. One course. *Fischer, Hamilton, or Roth*

**109A. Health Psychology (P).** (SS) The role of behavior in the etiology, pathophysiology, and treatment of cardiovascular disease and endocrine disorders; psychoneuro-immunology; chronic pain; and life style behaviors with health consequences such as smoking and eating disorders. Not open to students who have taken Psychology 98. One course. *Hamilton or staff*

**109B. Stress and Coping (P).** (SS) Psychological theory and empirical work on stress and coping, with an emphasis on post-traumatic stress. Not open to students who have taken Psychology 163S. Prerequisite: Psychology 99. One course. *Staff*

**109C. Behavioral Medicine (P).** (SS) Overview of the interdisciplinary field of behavioral medicine, emphasizing the integration of the social and behavioral sciences in the service of understanding physical health and illness. Psychosocial risk factors for medical illness; biobehavioral mechanisms whereby psychosocial risk factors affect pathophysiology; and biobehavioral intervention to treat and rehabilitate patients with major medical disorders in interdisciplinary settings. Psychology 109A encouraged as a prerequisite, but not required. One course. *R. B. Williams*

**111. Learning and Adaptive Behavior (B, C).** (NS) Principles of instrumental learning in animals and humans. Prerequisite: none, but some knowledge of quantitative science desirable. One course. *Higa or Staddon*

**112. Cognitive Neuroscience (C).** (SS) Relating empirical findings in perception and cognition to structures and processes in the brains of animals and people. Emphasis on vision. Prerequisite: prior course in psychology. One course. *Lockhead*

- 113A. Self and Society (P). (SS)** See C-L: Cultural Anthropology 141; also C-L: Women's Studies. One course. *Apte, Ewing, or Luttrell*
- 113B. Psychological Anthropology (C, D, P). (SS)** See C-L: Cultural Anthropology 165. One course. *Ewing or Strauss*
- 113C. Culture and Thought (C). (SS)** See C-L: Cultural Anthropology 151. One course. *Quinn or Strauss*
- 114. Personality (P). (SS)** Representative theories of personality from Freud to the present, emphasizing problems of normal personality structure, dynamics, development, and assessment. One course. *Curry*
- 116. Social Psychology (P). (SS)** Problems, concepts, and methods in the study of social interaction and interpersonal influence. C-L: Sociology 106 and Women's Studies. One course. *Costanzo, Fischer, George, or staff*
- 117. Statistical Methods (G). (QR)** See C-L: Sociology 133. One course. *Land or Spenner*
- 118. Special Topics in Social Psychology (P). (SS)** Study of one broad area in social psychology; exact content area varies by semester. Possible areas include social cognition, social influence, and applied social psychology. Prerequisite: Psychology 99, 108, or 116. One course. *Costanzo, Fischer, or Hamilton*
- 119A. Abnormal Psychology (P). (SS)** Disordered behavior and constructive personality change viewed in interpersonal and social context for purposes of understanding normal and abnormal personality development and functioning. One course. *Carson or Robins*
- 119B. Child Clinical Psychology (D, P). (SS)** Theories of clinical intervention with children and families, evaluation of therapy and epidemiological data. Prerequisite: Psychology 97 or 99. One course. *Gustafson*
- 120. Comparative Psychology (B). (SS)** A survey of animal behavior from the psychologist's perspective. One course. *Holland*
- 121. Early Cognitive Development (C, D). (SS)** Perceptual and conceptual development in humans from birth through early childhood. Topics include how infants and young children perceive the world, how they acquire knowledge about the world, and how they remember and use this knowledge over time. Prerequisite: Psychology 97 or 105. One course. *Needham*
- 122. Psychology of Thinking (C). (SS)** An overview of high level cognitive processes. Topics include categorization, problem solving, decision making and human factors. Prerequisite: one previous psychology course. One course. *Serra*
- 123. Introduction to Human Memory (C). (SS)** A review of the theoretical and empirical study of the encoding, storage, and retrieval of information. The development, pathology, and computer modeling of memory in clarification of basic process and applications. One course. *Hasher, Rubin, or Serra*
- 124. Human Development (D). (SS)** Especially for sophomores. Juniors and seniors by consent only. See C-L: Human Development 124; also C-L: Sociology 124. One course. *Gustafson, Maxson, or staff*
- 125. Memory and the Brain (B). (NS)** Brain function in relation to the phenomenon of memory. Historical and current perspectives. C-L: Linguistics. One course. *Swartzwelder*
- 126. Behavior and Neurochemistry (B, P). (NS)** The role of brain chemicals (neurotransmitters, peptides, and hormones) in behavior. Hypotheses addressing the neurobiology of mental disorders. Prerequisite: Psychology 91 or 103. One course. *Meck*

**127. Drugs, Brain, and Behavior (B). (NS)** Mechanisms by which psychoactive drugs act. Changes which occur with chronic use of drugs; drug abuse and dependence. Social and legal implications of psychoactive drugs. This course is designed for both science and nonscience majors. Prerequisites: introductory biology (Biology 25L) and chemistry (Chemistry 11L, 12L). C-L: Pharmacology and Cancer Biology 160. One course. *Kuhn*

**129. Psychology and the Law (P). (SS)** The relationship between psychology and the legal system. Theory, empirical findings, and court cases in mental health law, including the insanity defense, competency to stand trial, and civil commitment. Use of social science data in several legal domains, including expert testimony in rape and domestic assault trials, employment discrimination, and trademark infringement. Prerequisite: Psychology 99 or 108 or Psychology 116. One course. *Fischer*

**130. Psychosocial Aspects of Human Development (D). (SS)** See C-L: Human Development 180; also C-L: Sociology 169. One course. *Gold*

**131. Early Social Development (D). (SS)** The developmental course of children's social behavior. The role that certain relationships (for example, mother, father, siblings, peers, friends) play in that development as well as the effects of other influences (for example, school, television, divorce, daycare). Prerequisite: Psychology 97 or 105. One course. *Hill or Putallaz*

**132A. Cognitive Aspects of Human Development (C, D). (SS)** The development of mind and its relation to other aspects of human development. Development of visual and auditory perception, language, memory, concepts, problem solving, academic skills, social cognition, and cognition and culture. Prerequisite: one course in psychology. One course. *Mazuka*

**132B. Cross-Cultural Perspectives on Development: A View from Japan (C, D). (SS)** Cross-cultural examination of issues in developmental psychology from an Asian perspective, especially from modern day Japan. Selected topics in developmental psychology evaluated from the perspectives of Japan and other cultures in Asia, and contrasted to American studies. C-L: Cultural Anthropology 166. One course. *Mazuka*

**133. Fundamental Issues in the Study of the Brain (B). (NS)** Classic papers in the fields of systems, developmental, cellular, and molecular neurobiology. C-L: Neurobiology 133. One course. *W. C. Hall*

**134. Psychology of Language (C). (SS)** Psychological "reality" of linguistic structures, language and cognition, biological bases, animal communication, language pathologies, nonverbal communication, language versus music, linguistic universals, and bilingualism. Everyday language phenomena (for example, slips of the tongue) as well as the experimental and theoretical literature. Psychology 92 or 107 desirable. C-L: Linguistics 110. One course. *Day*

**135. Principles of Neurobiology (B). (NS)** Prerequisites: Biology 25L, and Chemistry 12L or equivalent. See C-L: Biology 154; also C-L: Neurobiology 154, and Neurosciences. One course. *LaMantia or Nowicki*

**136. Developmental Psychobiology (D). (SS)** Early human social development, including the formation of social relationships, the origins of altruism and aggression, sex differences, peer relationships, and verbal and nonverbal communication patterns. Prerequisite: Psychology 91, 97, or 105, or consent of instructor. One course. *Eckerman*

**137. Adolescence (D). (SS)** Adolescent development, including identity formation, intelligence, sexuality, peer and parent relationships, vocational choices, drugs, and psychopathology. Theory and empirical findings. One course. *Stocking*



**139. Psychobiology of Motivation (B, D). (NS)** The psychobiology of such concepts as motivation, drive, incentive, reward, and goal-directed behavior. The neural mechanism; developmental perspectives. Prerequisite: Psychology 91. One course. *W. G. Hall or staff*

**143S. Mind, Brain, and Computers (B, C). (NS)** How computers contribute to the integrative study of the mind and brain. Topics include real and artificial neurons and neural networks, finite automata, feedback systems, pattern recognition by neural networks and the brain, motor programs, connectionism, supervised and unsupervised learning, synaptic matrices, Turing machines, self-reproducing automata, and genetic algorithms. Recommended for psychology, biology, philosophy, computer science, and engineering majors. Minimal computer literacy advised. C-L: Linguistics. One course. *Schmajuk*

**150S. Hormones and Behavior (B, P). (NS)** Behavioral neuroendocrinology of sexual differentiation, reproduction, emotion, feeding, learning, and memory in animals and humans. Prerequisite: Psychology 91. C-L: Women's Studies. One course. *C. Williams*

**151S. Preventive Intervention with Children (D, P). (SS)** Theories and strategies of prevention of human dysfunction. Prediction at risk in child and adolescent populations. Practicum assignments in community settings. Consent of instructor required. One course. *Miller-Johnson*

**153S. Issues in Language Development (C, D). (SS)** "Critical Period" in language development, the role of "motherese," infant speech perception, innovative word creation, telegraphic speech, bilingualism and second language learning, learning to read, language, cognition and culture, and language pathology. C-L: Linguistics. One course. *Mazuka*

**154S. Education, Children, and Poverty (D). (SS)** Psychological hypotheses concerning the roles of preschool intervention programs, improved quality of resources, teacher expectancy effects, and enhancement of pupil self-confidence in relation to the goal of improved cognitive competence for poverty background children. Criteria for defining competence, such as scores on psychometric intelligence tests, performing on Piagetian tasks, and development of specific skills. Interpretations concerning intelligence and cognitive deprivation in poor children in light of relevant psychological evidence. Prerequisite: one course in psychology or consent of instructor. One course. *M. Wallach*

**157S. Life Span Analysis of Social Relationships (D, P). (SS)** The developmental changes that occur in social relationships (for example, parent, sibling, peer) across the life span; the differing roles these relationships play in the development of the individual. Prerequisite: Psychology 97 or 105. One course. *Putallaz*

**158S. Sleep: Its Nature and Function (B). (NS)** Explores the phenomena of sleep over the full range of biological and psychological aspects. Function of sleep and consequences of sleep loss and change. Sleep disorders. Prerequisite: Psychology 91. One course. *Marsh*

**159S. Biological Psychology of Human Development (B, D, P). (SS)** Multidisciplinary perspectives bearing on key processes in human development from infancy through old age; the way that biological and psychological processes act together in normal and pathological behavior and development. Clinical case material and videotapes. Preference given to senior psychology majors and to students in the Program in Human Development. Consent of instructor required. C-L: Human Development. One course. *Thompson*

**162S. Clinical Issues: Conceptions, Techniques, and Problems of Professional Clinical Psychology (P). (SS)** Assessment of personality and psychopathology. Consultation and psychotherapy in individuals, groups, family, and organizational contexts. Research on clinical questions. Intended for those contemplating advanced graduate or professional study and careers in clinical psychology, counseling, psychiatry, social work, or cognate fields. Prerequisites: junior or senior status and consent of the instructor. One course. *Lakin*



**165S. Neurobiology of Learning and Memory (B). (NS)** The literature on neurobiological mechanisms of learning and memory. Readings on important historical discoveries; studies on the processes whereby the brain encodes and stores information. Readings selected to integrate information from neuroanatomical, behavioral, neurochemical, and neurophysiological experiments related to memory. Prerequisite: Psychology 91. One course. *Swartzwelder*

**167S. Brain Mechanisms of Behavior (B, C). (NS)** General physiological principles of brain organization in relation to behavioral processes from sensation to concept formation. Discussions of original readings from seminal papers in the early nineteenth century to the present. Prerequisite: Psychology 91. One course. *R. Erickson*

**169S. Eating Behavior and Disorders (B). (SS)** The interaction of taste and smell with obesity, anorexia, and nutritional status including that of the elderly. Prerequisite: Psychology 91. One course. *S. Schiffman*

**170S, A-R, U-Z. Selected Problems.** New courses not yet in the bulletin are designated as 170S or 270S depending on their level. Since all faculty offer these courses, their contents vary accordingly. Different courses indicated by the letter. One course. *Staff*

**171T, A-R. Tutorials.** Small group discussions about influential books and articles in psychology. The availability of tutorials, their content, and the instructors will be announced before registration. Different courses indicated by letter. Consent of instructor required. Pass/fail grading only. Half course. *Staff*

**173S. Theoretical Issues in General Psychology (C, D, P). (SS)** In-depth consideration of certain issues that cut across different areas of psychology: Are human beings bound to act in their own interests, or can they be genuinely altruistic? What do we mean when we talk about the mind or mental states, how do we know about these states in others as well as ourselves, and how are these states related to the body? Is psychology a science? Should it try to be, can it be, a science? One course. *L. Wallach*

**174S. Infancy (C, D, P). (SS)** Covers perceptual, cognitive, social, and motor development during the first two years of life, with a focus on the connections between developments in these four areas. Prerequisites: Psychology 97 or 105 and one other psychology course. One course. *Eckerman or Needham*

**175S. Psychophysiology (B). (NS)** How emotional and cognitive processes are expressed physiologically, and how this can be used to understand how the brain works. Special attention given to how electrical activity of the brain is related to memory, selective attention, and decision making. A course in biological psychology (for example, Psychology 91) provides the proper background, but is not required. One course. *Marsh*

**176S. Great Ideas in Psychology (C). (SS)** Ideas in psychology drawn from various content areas (for example, perception, personality, motivation, biological bases, social, cognitive, developmental, learning, clinical) and various methodological approaches (for example, experimental, introspection, observation, interview, longitudinal, simulation). Not open to students who have taken Psychology 204S. Prerequisites: junior or senior psychology-major status and consent of instructor. One course. *Day*

**177S. Human Sexuality (B). (NS)** The biological, endocrinological, and physiological correlates of human sexual behavior including sexual differentiation, pubertal development, adult male and female sexual behavior, premenstrual syndrome, menopause, sexuality and aging, homosexuality, and deviant sexual behavior. Prerequisite: Psychology 91 or background in biology. C-L: Study of Sexualities. One course. *Staff*

**178S. The Psychology of Exceptional Ability (C, D). (SS)** Examines various approaches to the study of exceptional intellectual, cognitive, academic, and artistic abilities, with an emphasis on children and adolescents traditionally referred to as gifted, talented, or precocious. Psychosocial and emotional aspects and consequences of exceptional ability. The Duke University Talent Identification Program (TIP) will be a focus as well as a resource. Prerequisites: courses in either developmental or cognitive psychology and statistics recommended. C-L: Education 178S. One course. *Goldstein*

**180S. Advanced Topics in the Psychology of Gender (P). (SS)** Study of one broad domain in the psychology of gender, exact content area to vary by semester. Emphasis on how gender influences human experience and behavior. Possible areas include theory of gender differences; victimology; gender role socialization; psychological issues in marriage, sexuality, and parenthood; biosocial aspects of gender; gender and mental health; and achievement. Prerequisites: Psychology 106 and consent of instructor. C-L: Women's Studies. One course. *Fischer, Hamilton, or Roth*

**181A, S. Methods in Behavioral Neurobiology (B). (NS)** Research in neural bases of behavior using simple biological systems as models for more complex behavior. Laboratory experience in experimental methodologies. Observational techniques in study of natural behaviors and neurophysiological recording and stimulation. Not open to students who have had Psychology 149S. Prerequisites: Psychology 91 or background in biology, and consent of instructor. One course. *W. G. Hall or staff*

**181B, S. Research Methods in Animal Learning (B, C). (NS)** Behavioral experiments with rats and pigeons. Basic tools and methods used in study of animal learning (experimental design, methodology, data analysis, basic theoretical interpretation of results.) Prerequisite: Psychology 111 or 115 strongly recommended. One course. *Higa*

**182A, S. Cognitive Laboratory (C). (SS)** Human cognition; language, memory, problem solving, and other higher mental processes. Not open to students who have had Psychology 143S. Prerequisite: Psychology 92, 107, 112, or 123. One course. *Hasher, Lockhead, Rubin, or Serra*

**182B, S. Perception Laboratory (C). (SS)** Experimental approaches to basic phenomena of perception as determined by conditions in the external situation and the person: biological and psychological. Not open to students who have had Psychology 148S. Prerequisite: Psychology 112 or consent of instructor. One course. *Lockhead*

**182C, S. Neural Networks and Psychology (B, C). (NS)** Several neural networks applied to perception, learning, and cognition. Neural architectures including adalines, perceptron, backpropagation, autoassociative nets, Boltzman machines, reinforcement nets, competitive learning, and adaptive resonance theory. Computer simulations of the different networks. Prerequisites: Mathematics 31 and 32. One course. *Schmajuk*

**183A, S. Research Methods in Developmental Psychology (D). (SS)** Students who have had Psychology 140S not eligible for enrollment. Prerequisite: Psychology 97 or 105 or consent of instructor. One course. *Eckerman*

**183B, S. Child Observation (D). (SS)** Introduction of research methods used to study children, with particular emphasis on observational techniques. Prerequisites: Psychology 97 or 105 and consent of instructor. One course. *Putallaz*

**185A, S. Experimental Approaches to Personality (P). (SS)** Methods applied to personality research. Not open to students who have taken Psychology 145S. Prerequisite: one course in psychology. One course. *M. Wallach*

**185B, S. Research Methods in Social Psychology (P).** (SS) Study of empirical research methods used to study contemporary issues in social psychology, including both experimental and nonexperimental strategies. Not open to students who have taken Psychology 147S. Prerequisite: Psychology 99, 108, or 116. One course. *Curran or staff*

**185C, S. Research Methods in Health and Clinical Psychology (P).** (SS) Contemporary approaches to psychologically based research in health and mental health. Survey, laboratory, and/or narrative self-report methodologies. Class research projects. Prerequisites: Psychology 99 and Statistics 110 or the equivalent. One course. *Blumenthal*

**190S. History of Modern Psychology (B, C, D, P).** (SS) Major developments in psychology from the late nineteenth century to the present, with emphasis on the history of ideas. The experimental beginnings of psychology as a science, psychoanalysis, evolutionary thinking, behaviorism, cognitive psychology, and the psychology of social issues. Prerequisite: prior course in psychology or consent of instructor. One course. *H. Schiffman or L. Wallach*

**191, 192, 193, 194. Independent Study.** Directed reading and research. 191, 192: junior year fall, spring; 193, 194: senior year fall, spring. Consent of instructor and director of undergraduate studies required. One course each. *Staff*

**198, 199. Distinction Program Sequence (G).** A formal training/supervision component of the Distinction Program in Psychology. Consent of director of undergraduate studies required. Pass/fail grading only. Half course each. *Staff*

#### **For Advanced Undergraduates and Graduates**

**202S. Autobiographical Memory (C).** (SS) A review and critical analysis of the literature, theory, and empirical study of autobiographical memory within cognitive psychology. Consent of instructor required. One course. *Rubin*

**203S. Seminar in Cognitive Neuroscience (C).** (SS) Relating empirical findings in perception and cognition to structures and processes in the brains of animals and people. Emphasis on vision. Consent of instructor required. One course. *Lockhead*

**205S. Children's Peer Relations (D).** (SS) An examination of the empirical literature with emphasis on the functions that peers serve for children, the developmental course of these relationships, the clinical ramifications and possible explanations for inadequate peer relations (including an examination of the family's role), and interventions used to improve children's relationships with their peers. Consent of instructor required. One course. *Asher or Putallaz*

**206S. Pediatric Psychology (D, P).** (SS) The conceptual and methodological bases for the field. Case material illustrating how developmental, biological, and psychosocial processes act together in child health and illness. Focus on adjustment and coping with illness and treatments related to cystic fibrosis, sickle cell disease, cancer, diabetes, and seizure disorders. Consent of instructor required. One course. *Staff*

**207S. Topics in Psychobiology (B).** (SS, NS) Prerequisites: senior standing, Psychology 49S (Psychobiology), and consent of instructor. See C-L: Distinguished Professor Courses 207S. One course. *Brodie*

**209S. The Cognitive Psychology of Oral Traditions (C).** (SS) The structure of songs and genres from oral traditions and the processes used in their composition, transmission, and recall, analyzed from the perspective of cognitive psychology. Consent of instructor required. One course. *Rubin*

**210S. Cognition (C).** (SS) Schematic view of cognitive psychology plus intensive study of two to three specific research topics such as forms of representation, individual differences,



and problem-solving models. Emphasis on alternative experimental and theoretical approaches. Prerequisites: Psychology 92 or 107 for undergraduates and consent of instructor. C-L: Linguistics. One course. *Day*

**211S. Neural Development and Comparative Cognition (B, C). (NS)** Current research on neural development of cognitive processing in several sensory systems (for example, auditory, visual, and olfactory systems), and in several species (for example, aplysia, song birds, rats, cats, monkeys, and humans) with regard to how attention and memory processes develop. Both the normal ontogeny of cognitive ability and differentiation that is altered during an early sensitive period of development. Prerequisites: three courses in biological psychology for undergraduates and consent of instructor. One course. *C. Williams*

**212S. Human Memory (C). (SS)** Classical and modern literature, data, and theories relating to mechanisms of information processing, storage, and retrieval. Consent of instructor required. One course. *Hasher or Rubin*

**214S. Development of Social Interaction (D, P). (SS)** Major concepts and methods pertaining to early social development, emphasizing human social behavior and a developmental psychobiological approach. Consent of instructor required. One course. *Eckerman*

**215S. Cognitive Development (C, D). (SS)** Intensive critical evaluation of major approaches to the development of knowledge, including those of Piaget, Thomas Kuhn, Vygotsky, Eleanor Gibson, Kohlberg, and others. Consent of instructor required. One course. *Staff*

**217S. Advanced Social Psychology (P). (SS)** Theoretical and empirical approaches to understanding socially significant human behavior and experience. Review of classic and contemporary research literatures, with an emphasis on applied issues. Prerequisites: Psychology 99 or 108, and 147S, and consent of instructor. C-L: Women's Studies. One course. *Costanzo or Fischer*

**218S. Personality, Stress, and Disease (P). (SS)** The interaction between person and social environment as a contributor to development of physical disease. Both epidemiological and laboratory-based research considered. Prerequisites: Psychology 98 or 109A for undergraduates and consent of instructor. One course. *R. B. Williams*

**220S. Psycholinguistics (C). (SS)** Selected topics such as neurolinguistics, linguistic versus pictorial representation, individual differences, oral versus written expression, language and personality, and the language-thought interaction. Prerequisites: Psychology 134 for undergraduates and consent of instructor. C-L: Linguistics. One course. *Day or Mazuka*

**223S. Animal Learning and Cognition: A Neural Network Approach (B, C). (NS)** Several connectionist theories of animal learning and cognition. Neural network theories of classical conditioning; the concepts of models of the environment, prediction of future events, reliable and salient predictors, redundancy reduction, competition for limited capacity short-term memory, mismatch between predicted and observed events, stimulus configuration, inference generation, modulation of attention by novelty, and timing. Neural networks of operant conditioning; the concepts of goal-seeking mechanisms, response-selection mechanisms, and cognitive mapping. How neural network models permit simultaneous development of psychological theories and models of the brain. Prerequisites: Mathematics 31, 32 for undergraduates and consent of instructor. One course. *Schmajuk*

**224S. Timing and Time Perception (B, C). (NS)** Selected topics dealing with the psychobiological bases of internal clocks used to time in the-seconds-to-minutes range. Impact of neural pacemakers systems on cognitive processes involved in divided attention, temporal memory, and the determination of the quantal unit of time and/or consciousness. Consent of instructor required. One course. *Meck*



**225S. Ingestion: Behavior and Neurobiology (B). (NS)** Selected topics dealing with the behavioral and neural organization of feeding and drinking. Reading typically includes: ethological and behavioral system perspectives on ingestive behavior organization; the learning and conditioning literature relevant to experience effects on feeding and feeding development; recent research on the physiological and metabolic control of ingestion; and current considerations of the neurobiological basis of ingestive behavior. Emphasis on understanding ingestion as a sequence of behavior components whose control is both hierarchical and dynamic. Prerequisites: Psychology 91 for undergraduates and consent of instructor. One course. *W. G. Hall*

**227S. Behavioral Physiology: Basic Systems (P). (SS)** Organ systems review of physiology, emphasizing the role of the central nervous system and behavior in physiological function. Prerequisites: Psychology 91 or 159S for undergraduates and consent of instructor. One course. *Surwit*

**228S. Behavioral Treatment of Disease (P). (SS)** Critical review of the literature on the effective behavioral interventions in the treatment of physical illness. Focus on the role of the psychologist in medical settings. Consent of instructor required. One course. *Surwit*

**230S. Social Behavior of Animals (B, D, P). (NS)** Developmental, ecological, and physiological aspects of territorial, sexual, parental, and aggressive behavior. Consent of instructor required. One course. *C. Erickson*

**233S. Nature and Nurture in Development (B, D, P). (NS)** The nature-nurture dichotomy and reasons it is invalid; applications of the arguments and evidence to such student selected topics as personality, intelligence, behavior genetics, social behavior, infant behavior, criminality, mental disorder, homosexuality, sociobiology. Prerequisites: Psychology 91 and consent of instructor. One course. *Gottlieb*

**234S. Advanced Personality (P). (SS)** Selected topics of current interest concerning empirical research on personality. Strategies for the definition of research questions and the evaluation of research progress. Consent of instructor required. One course. *M. Wallach*

**249S. Anthropology and Psychology (C, P). (SS)** See C-L: Cultural Anthropology 249S. One course. *Quinn or Strauss*

**255S. Life-Span Development (C, D, P). (SS)** Analysis of development across the life span. Origins and course of cognitive and emotional development; components of personality and social development. Applications to models of both normative and pathological development. Prerequisites: Psychology 97 or 105 for undergraduates and consent of instructor. One course. *Costanzo, Goldstein, or staff*

**258S. Social Behavior and Personality (P). (SS)** A broad examination of current theory and research on the interpersonal, personological, and social cognitive influences on social behavior and social interaction. Emphasis on contemporary thought on issues such as the nature of social influence, the function and construction of the self, relationship formation and maintenance, aggression and altruism, personality-based mediators and moderators of social behavior, and the application of social psychological theory and research to the study of clinical, social legal, and educational issues. Methodological approaches to the study of social phenomena including experimental, quasi-experimental, narrative, observational, and correlational models. Prerequisites: Psychology 99 or 116 and 185A or 185B and Statistics 110, Psychology 117 or equivalent and consent of instructor for undergraduates. One course. *Costanzo*

**261S. Advanced Learning Theory (C). (SS)** Selected topics in the data and theory of basic processes of learning, memory, and motivation in animals and humans. Emphasis on the

nature of theory construction and evaluation, and the relation of current perspectives to older ones. Consent of instructor required. One course. *Holland*

**262S. Minority Mental Health: Issues in Theory, Treatment, and Research (P). (SS)** Survey and discussion of theoretical, research, and clinical issues in minority mental health with special emphasis on African-Americans. Prerequisites: Psychology 119 for undergraduates and consent of instructor. One course. *Anderson or McLoyd*

**264S. Gender, Hormones, and Health (P). (SS)** Hormone effects on behavior in animals and humans with topics including pubertal, menstrual-cycle, sex-related, and gender-related effects on mood, behavior, cognition, and health. Consent of instructor required. C-L: Study of Sexualities and Women's Studies. One course. *Hamilton*

**270S, A-R, U-Z. Selected Problems.** New courses not yet in the bulletin are designated as 170S or 270S depending on level. Since all faculty offer these courses, their contents vary accordingly. Different courses indicated by the letter. Consent of instructor required. One course. *Staff*

**273. Statistics I (G). (QR)** Foundations of probability and statistical inference. Introduction to the general linear model via multiple regression. Emphasis on application via statistical computing with SAS. Prerequisites: Psychology 117 or Statistics 110 for undergraduates and consent of instructor. One course. *Curran or staff*

**274. Statistics II (G). (QR)** Basic and advanced ANOVA models via the GLM. Broad-based overview of multivariate models, including MANOVA, canonical correlation, discriminant analysis, and factor analytic models. Emphasis on application and use of computer packages. Prerequisites: Psychology 117 or Statistics 110 and Psychology 273 for undergraduates and consent of instructor. One course. *Curran or staff*

**288S. Advanced Topics in Social Science and Law (P). (SS)** Study of one broad domain in social science and law; exact content area to vary by semester. Emphasizes how empirical findings in social science are translated and used by the legal system. Possible areas include women's legal issues, family violence, expert testimony, employment discrimination. Prerequisites: Psychology 129 for undergraduates and consent of instructor. One course. *Fischer*

## COURSES CURRENTLY UNSCHEDULED

**110. Applied Psychology (P). (SS)**

**115. Introduction to Learning Theory (C). (SS)**

**128. Memory Disorders (C). (SS)**

**138. Language Development (C, D). (SS)**

**152S. Community Psychology (D, P). (SS)**

**168S. Body, Brain, and Auditory Perception (B). (NS)**

**172S. Pain: Coping and Adaptation (H). (SS)**

**186A, S. Measurement of Individual Differences (B, C, D, P). (SS)**

**208S. Emotion (P). (SS)**

**280S. History and Systems of Psychology (B, C, D, P). (SS)**

**289S. Psychology of Prevention (P). (SS)**

## THE MAJOR

### For the A.B. Degree

*Major Requirements.* Ten courses in psychology (eight of which must be at the level of 100 or above) are required for the major, which is devised to provide depth and breadth, a small group course in psychology, and familiarity with the quantitative techniques and methods used in psychology. For breadth, the student is required to take two introductory and survey

courses including: (1) either 91 (Biological Bases of Behavior) or 92 (Cognitive Psychology), and (2) 97 (Developmental Psychology), or 99 (Personality and Social Behavior). These introductory and survey courses define four areas of concentration in psychology. For depth, the student is required to take at least two courses in one of these areas in addition to the introductory and survey course. For instruction in small groups, the student is to take at least one seminar (number 140S and above, including 200-level courses, but excluding the 181-186S methods courses). It is advisable that this seminar be in the student's area of concentration. For quantitative techniques used in psychology, the student is to take one of the following: Mathematics 136; Sociology 133; Statistics 110, 112, 113, 210B, 213; or Psychology 117. One of these courses will count toward the ten courses required of the major. Each student will be introduced to the methods used in psychology by taking one of the following courses: Psychology 101, or one of the laboratory courses, Psychology 181-185.

A student guidebook describing the curriculum in detail is available from the director of undergraduate studies. Of the ten psychology courses required for the major at least eight must be taken in the department at Duke; others, if approved, may count toward the 34 credits needed for graduation.

### **For the B.S. Degree**

As for the A.B. degree, with the following additions: (1) Mathematics 32 or equivalent; (2) six natural science courses in at least two of the following mathematics/natural science departments: mathematics (100-level or above, in addition to the Statistics requirement, above), computer science (100-level or above), chemistry, physics, biological anthropology and anatomy, and biology; (3) at least three of the six mathematics/natural science courses must be numbered 100 or higher; (4) at least one course that involves extensive laboratory or fieldwork (for example, experimental methods or independent research).

### **THE MINOR**

*Requirements.* Five courses in psychology including the breadth requirement of two introduction and survey courses and the depth requirement of two more courses following one of these introduction and survey courses as described above for the major, plus one elective course numbered 100 or above.

### **SPECIAL OPPORTUNITIES**

#### **Neurosciences Concentration within B.S. Degree**

Students completing a B.S. in psychology may elect to fulfill the requirements for a specialized concentration in neuroscience within the psychology major. Students in the neuroscience concentration will be expected to complete the following: the requirements for a B.S. major in psychology, the two introductory (core) course requirements (e.g., Psychology 91 and Biology 154/Psychology 135—prerequisites: Biology 25L and Chemistry 12L), and five elective courses to be selected from the listing of approved neuroscience courses in their major. Independent Study (Psychology 191-194) is highly recommended for all participants in the program and may be counted toward completion of the elective requirements. Completion of that concentration would be indicated on the official transcript. For more information, students should contact the director of undergraduate studies in psychology or either of the program co-directors, Professors Warren Meck (psychology: experimental), e-mail: meck@psych.duke.edu or Stephen Nowicki, e-mail: snowicki@acpub.duke.edu, consult the neuroscience program world-wide-web homepage at <http://www.duke.edu/neurosci/>, or obtain materials at the program office, Rm. 245 Sociology/Psychology.

#### **Human Development Program**

Students completing a B.S. or B.A. in psychology who are interested in human development may elect to fulfill the requirements for a Human Development Program



certificate. The goal of this interdisciplinary program is to foster an understanding of how biological, psychosocial, and cultural processes act together in development throughout the life course, and of the complementarity of disciplinary perspectives. Completion of the program certificate would be indicated on the official transcript. For information contact the director of the Human Development Program, Professor Deborah Gold.

### Relation to Other Departments and Programs

Many psychology courses count toward certificates or concentrations in other areas as well as neurosciences and human development, for example: the certificate in early childhood education studies, the neuroscience certificate, the animal behavior concentration in the biology major, and the primatology concentration in the biological anthropology and anatomy major.

### Independent Study

A program of individualized readings or an empirical research project may be carried out by arrangement with a faculty supervisor and enrollment in Psychology 191-194. A written plan of the program must be approved by the supervisor and the director of undergraduate studies. At most only one of these independent study courses may count toward the area of concentration requirement, and only two may count toward the major.

### Graduation with Distinction

Graduation with distinction in psychology requires completion of a special project, usually based on Independent Studies, the written form of which is reviewed in an oral examination by a committee composed of three faculty members. This must be done in time so that the mentor can nominate the student for this award one month before graduation. One level of distinction is awarded.

A student submitting a paper with extraordinary excellence may be given the Zener Award.

## Public Policy Studies (PPS)

Professor Cook, *Chair*; Associate Professor Lipscomb, *Director of Undergraduate Studies*; Professors Ascher, Behn, Clotfelter, Fleishman (law), Healy (environment), Hough (political science), Keyssar (history), Kuniholm, Ladd, Magat (business), Mickiewicz, Pearsall (engineering), Price (political science), Schroeder (law), and Sloan (economics); Associate Professors Conrad, Mayer, and Moore (business); Assistant Professors Hamilton, Korstad, Pickus, Ramachandran, Roselius, and Stangl (statistics); Professor Emeritus Barber (political science); Professors of the Practice Brown, Harris, Jones, Raspberry, Sanford, Stubbing, and Tifft; Assistant Research Professors Conover, Whetten-Goldstein, and Taylor; Visiting Professors Felsman and Lapp; Visiting Assistant Professor Fischle; Visiting Professor of the Practice Gergen; Lecturers O'dor, Payne, and Stevens; Adjunct Lecturer Reid; Visiting Lecturers Ahearne, Barboriak, Bates, Blount, Blue, Bovbjerg, Coble, Conti, Dancy, Dodson, Dorsen, Eckard, Emison, Frey, Hart, Henderson-James, Jaroslovsky, Kaufman, Lin, Montgomery, Muskovitz, Prak, A. Rimer, L. Rimer, Shaikun, Wright, and Yeoman; Senior Research Scientist Vaupel

A major is available in this department.

Courses in public policy are open to all students providing that any prerequisites are met.

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**55D. Introduction to Policy Analysis. (SS)** Basic concepts of analytical thinking including quantitative methods for assessing the probabilities of outcomes and appraising policy



alternatives. Illustrated by problems faced by busy decision makers in government, business, law, medicine. C-L: Health Policy. One course. *Hamilton, Lipscomb, or Mayer*

**80. Introductory and Basic Topics in Public Policy. (SS)** Topics vary each semester. Does not count for public policy studies major. One course. *Staff*

**100A. East Asian Political Economy: Institutions, Networks, and Politics. (SS)** (Taught in Korea and Taiwan.) See C-L: Sociology 188C; also C-L: Comparative Area Studies, and Political Science 100V. One course. *Staff*

**105S. American Communities: A Documentary Video Approach. (AL, SS)** Prerequisites: English 101A and any one of the following: Film and Video 100S, 101S, or 104S. See C-L: Film and Video 105S; also C-L: Cultural Anthropology 134S, History 150B, and Political Science 156S. One course. *Staff*

**107. Environmental Politics and Policies in the Industrial World. (SS)** See C-L: Political Science 107; also C-L: Comparative Area Studies. One course. *McKean*

**107D. Environmental Politics and Policies in the Industrial World. (SS)** See C-L: Political Science 107D; also C-L: Comparative Area Studies. One course. *McKean*

**108. AIDS: Ethics, Policy, and Representation. (SS)** See C-L: Women's Studies 108; also C-L: Study of Sexualities. One course. *Rudy*

**110. Economic Analysis for Public Policy-Making. (SS)** Application of microeconomic analysis to public policy areas, including agriculture, housing, taxation, and income redistribution. (Not open to students who have taken Economics 149, which also fulfills Public Policy Studies microeconomic requirement.) Prerequisite: Economics 52D or equivalent. One course. *Clotfelter, Conrad, Cook, Ladd, Lipscomb, or Roselius*

**114. Political Analysis for Public Policy-Making. (SS)** Analysis of the political and organizational processes which influence the formulation and implementation of public policy. Alternative models. Prerequisite: Political Science 90A, 91, 101, or equivalent. C-L: Political Science 145. One course. *Ascher, Fischle, Hamilton, Mayer, or Mickiewicz*

**115. Introduction to North America. (CZ, SS)** See C-L: North American Studies 110; also C-L: Cultural Anthropology 129, Economics 115, History 108F, Latin American Studies, Political Science 119, Romance Studies 125, and Sociology 109. One course. *Thompson*

**116. Policy Choice as Value Conflict. (SS)** Theoretical and practical problems in decision making in relation to conflicts of value and of interest. The manifestation of norms deriving from professional ethics, ideology, law, and other sources in such policy issues as welfare, environmental management, and national defense. One course. *Blount, Korstad, Payne, Pickus, or Rudy*

**116D. Policy Choice as Value Conflict. (SS)** Same as Public Policy Studies 116 except instruction is provided in two lectures and one small discussion meeting each week. One course. *Korstad, Payne, or Pickus*

**131S. Law, Culture, and the Russian Legal Tradition. (CZ, SS)** Open only to students in the FOCUS Program. See C-L: Russian 157S. One course. *Newcity*

**138S. Public-Private Leadership. (SS)** Leadership of and relationships between organizations in the public, private nonprofit, and business sectors. Includes government privatization, nonprofit commercial ventures, socially responsible business activities, hybrid organizations, and cross sector collaborative initiatives. One course. *Brown*

**139S. Business Leadership, Social Responsibility, and Public Policy. (SS)** Effective business leadership, including individual leadership and companies as leaders in society. One course. *Brown*

**140. Women as Leaders. (SS)** Intellectual and experiential exploration of the theory and practice of leadership, with an emphasis on the special role gender plays. Topics include: authority, conflict, power, and an assessment of each student's potential for leadership. Small group work required. C-L: Women's Studies. One course. *Staff*

**141. Social Policy in America. (SS)** Public policies in the United States that affect individuals in their roles as family members and workers. Social problems associated with poverty, unemployment, old age, distressed urban and rural communities, discrimination, and changing family patterns; theories seeking to explain these problems. History of public policies adopted to deal with such social problems. Current policies, their budgetary impact, their effectiveness, and the political debate that surrounds them. One course. *Clotfelter or Korstad*

**142S. Chinese Economy in Transition. (SS)** Prerequisites: Economics 1 or 51, and 2 or 52. See C-L: Economics 142S; also C-L: Comparative Area Studies. One course. *Yang*

**143D. Environmental Politics Beyond Borders (B). (SS)** See C-L: Political Science 148D; also C-L: Comparative Area Studies. One course. *McKean*

**145. Leadership, Policy, and Change. (SS)** Ethical and practical problems of leadership, including motivation, organizational morale, and strategies for large-scale change. Historical and modern case studies, literary examples, and political and psychological theory. One course. *Payne*

**145D. Leadership, Policy, and Change. (SS)** Same as Public Policy Studies 145 except instruction provided in two lectures and one discussion meeting each week. One course. *Payne*

**146. Leadership Development. (SS)** Effective leadership processes in different types of organizations and situations. Includes theory and personal application. One course. *Brown*

**147. Environmental Politics and Policies in the Developing World. (SS)** See C-L: Political Science 147; also C-L: Comparative Area Studies. One course. *McKean or Miranda*

**148S. Environmental Policy, Summer Internship.** Pass/fail grading only. Follow-up seminar in Washington, DC, to Public Policy Studies 149. Half course or one course. Prerequisite: Public Policy Studies 149. Variable credit. *Staff*

**149. United States Environmental Policy. (SS)** An overview of the major environmental legislation in the United States. Topics include: air and water pollution, hazardous waste, agriculture, wildlife, and institutions. Political, economic, ethical, and scientific analysis. Consent of instructor required. C-L: Environment 149. One course. *Miranda or A. Rimer and L. Rimer*

**150S. Policy, Philanthropy, and the Arts. (SS)** Democratic and aesthetic values in relation to past and present patterns of public, corporate, and philanthropic support for the arts. The uses of art criticism and political theory in evaluating subsidies, grants, tax incentives, and censorship. Consent of instructor required. One course. *Payne*

**151. Administration of Justice. (SS)** The history, structure, and function of the American legal system; emphasis on the courts as an institution for the resolution of disputes and administration of justice. Considers a variety of legal problems in both the criminal and civil law, examining policy choices that shape contemporary jurisprudence. Consent of instructor required. One course. *Montgomery*

**152S. Administration of Justice, Summer Internship.** Pass/fail grading only. Follow-up seminar in Washington, DC, or Research Triangle Park, NC, area to Public Policy Studies 151. Half course or one course. Prerequisite: Public Policy Studies 151. Variable credit. *Staff*

**154S. Free Press and Public Policy. (SS)** Policy problems and conflicts involved in applying First Amendment principles to print and electronic journalism. Topics include libel, privacy, national security, fair trial, and antitrust. Consent of instructor required. C-L: Film and Video. One course. *Stevens*

**155S. Free Press and Public Policy, Summer Internship.** Pass/fail grading only. Follow-up seminar in Washington, DC, to Public Policy Studies 154S. Half course or one course. Prerequisite: Public Policy Studies 154S. Variable credit. *Staff*

**156. Health Economics. (SS)** Prerequisite: Economics 149 or Public Policy Studies 110. See C-L: Economics 156; also C-L: Health Policy. One course. *Sloan*

**157. Health Policy. (SS)** Analysis of health care problems and policies. Consent of instructor required. C-L: Health Policy. One course. *Barboriak and Henderson-James*

**158S. Health Policy, Summer Internship.** Pass/fail grading only..Follow-up seminar in Washington, DC, to Public Policy Studies 157. Half course or one course. Prerequisite: Public Policy Studies 157. Variable credit. *Staff*

**159. State and Local Public Policy. (SS)** How state and local governments pay for public services. Financing education and transportation programs, the use of municipal bonds for capital projects, the design of intergovernmental aid programs, and state and local tax policy. Consent of instructor required. One course. *Blue, Clotfelter, or Ladd*

**161S. State and Local Public Policy, Summer Internship.** Pass/fail grading only. Follow-up seminar in Washington, DC, or Research Triangle Park, NC, area to Public Policy Studies 159. Half course or one course. Prerequisite: Public Policy Studies 159. Variable credit. *Staff*

**162. Human Rights in Theory and Practice. (SS)** See C-L: Political Science 162. One course. *Kiss*

**163S. Telecommunications Policy and Regulation. (SS)** Broadcast policies, the rise of cable television, spectrum allocation and authorization, and developments in common carrier telecommunications. Consent of instructor required. C-L: Film and Video. One course. *Prak*

**164S. Telecommunications Policy, Summer Internship.** Pass/fail grading only. Follow-up seminar in Washington, DC, to Public Policy Studies 163S. Half course or one course. Prerequisite: Public Policy Studies 163S. Variable credit. *Staff*

**165. American International Economic Policy. (SS)** Prerequisites: Economics 1 or 51 and 2 or 52. See C-L: Economics 165. One course. *Staff*

**167. International Policy. (SS)** Relationships among organizations and agencies involved in international political and economic affairs, focusing on selected problems of international policy. Consent of instructor required. One course. *Ascher, Kuniholm, or Mayer*

**168S. International Policy, Summer Internship.** Pass/fail grading only. Follow-up seminar in Washington, DC, to Public Policy Studies 167. Half course or one course. Prerequisite: Public Policy Studies 167. Variable credit. *Staff*

**169A. United States Foreign Policy I: From World War I to Vietnam War. (CZ, SS)** Basic assumptions about international interests and purposes of United States foreign policy and the means by which they have been pursued from the origins of the Cold War to the war in



Vietnam. Focus on crucial operational premises in the "defining moments" of United States diplomatic history. Policy-making models, politics of foreign policy, global environment within which United States policy is made, and uses of history. Special attention to the origins of the Cold War and the Vietnam War. C-L: History 167A. One course. *Kuniholm*

**169B. United States Foreign Policy II: From Vietnam War to the Present.** (CZ, SS) Examination of basic assumptions about international interests and purposes of United States foreign policy and the means by which they have been pursued from the end of the Vietnam War to the Clinton administration. Focus on crucial operational premises in the "defining moments" of United States diplomatic history. Various policy-making models, politics of foreign policy, global environment within which United States policy is made, and uses of history. Special attention to the Cold War, the Arab-Israeli wars, and the Gulf War. Continuation of Public Policy Studies 169A (recommended but not required). C-L: History 167B. One course. *Kuniholm*

**170S, 171S. Poverty and Public Education.** (SS) Contemporary issues in leadership and public policy. Social science research and data analysis techniques. Research projects examining policy issues concerning health, community, education, social services, family, employment and economy, and criminal justice and politics. For students interested in nonprofit, public sector, service-oriented programs that focus on youth and education, such as tutoring, Big Brother/Big Sister, and after-school programs. Prerequisite: for Public Policy Studies 171S/Education 181S: Public Policy Studies 170S/Education 180S. C-L: Education 180S, 181S. One course each. *Beckum*

**176S. American Communities: A Photographic Approach.** (SS) A documentary approach to the study of American communities through individual photographic projects centered around a community of the student's choosing. Consent of instructor required. C-L: Visual Arts 118S and Film and Video. One course. *Harris or Sartor*

**177S. Advanced Documentary Photography.** (SS) An advanced course for students who have taken Public Policy Studies 176S or have had substantial experience in documentary fieldwork. Students complete an individual photographic project and study important works within the documentary tradition. Prerequisite: Visual Arts 118S, Public Policy Studies 176S, or consent of instructor. C-L: Visual Arts 119S and Film and Video. One course. *Harris*

**178. Doing Documentary Work.** (AL, SS) Explores the work of documentary photographers and writers, and their struggles to reconcile scholarly, literary, and artistic pursuits with moral and ethical concerns. Class projects require students to create documentaries, to thereby connect readings, classroom discussion, and field experience through written or visual narratives. C-L: Visual Arts 178, English 171, and History 150C. One course. *Coles and Harris*

**180S. Writing for the Media.** (SS) Workshop on writing news stories, editorials, and features for the print media. Consent of instructor required. C-L: Film and Video. One course. *Dancy or Reid*

**181S. Advanced News Reporting.** (SS) Students report, write, and rewrite six in-depth stories during the semester. Assignments designed to explore investigative reporting techniques and the issues that arise in writing longer, more complex stories. Prerequisite: Public Policy Studies 180S or consent of instructor. C-L: Film and Video. One course. *Bates and Yeoman*

**187S. The Canadian Health Care System.** (SS) See C-L: Canadian Studies 185S; also C-L: Comparative Area Studies, Cultural Anthropology 185S, Economics 185S, History 108E, Political Science 185S, and Sociology 185S. One course. *Warren*



**190. Internship.** For students working in a public agency, political campaign, or other policy-oriented group under the supervision of a faculty member. Prior consent of assistant director of internships, placement, and alumni and director of undergraduate studies required. Pass/fail grading only. One course. *Staff*

**191, 192. Independent Study.** Directed reading and research. One course each. *Staff*

**193, 194. Independent Study.** Directed reading and research for seniors. One course each. *Staff*

**195, 196. Selected Public Policy Topics. (SS)** One course each. *Staff*

**195S, 196S. Selected Public Policy Topics. (SS)** Seminar version of Public Policy Studies 195, 196. One course each. *Staff*

**197. Marine Policy. (SS)** Formal study of policy and policy-making concerning the coastal marine environment. History of specific marine-related organizations, legislation, and issues and their effects on local, regional, national, and international arenas. Topics explored through use of theoretical and methodological perspectives, including political science, sociology, and economics. Consent of instructor required. (Given at Beaufort.) C-L: Environment 276 and Marine Sciences. One course. *Orbach*

**198S, 199S. Senior Honors Seminar. (SS)** Special research topics. Consent of the honors seminar instructor and director of undergraduate studies required. Prerequisite: for 199S: Public Policy Studies 198S. Half course, one course, respectively. *Cook*

### **For Seniors and Graduates**

**216S. Economics of Education. (SS)** Prerequisite: Economics 149 or Public Policy Studies 110. See C-L: Economics 216S. One course. *Clotfelter*

**218. Macroeconomic Policy. (SS)** Survey of macroeconomic theory and analysis of policies designed to reduce unemployment, stimulate economic growth, and stabilize prices. Conventional monetary and fiscal instruments, employment policies, and new policies designed to combat inflation. C-L: Economics 218. One course. *Lapp*

**236. Public Management I: Managing Public Agencies. (SS)** Operations management, information and performance, personnel management, public sector marketing. One course. *Behn*

**238. Public Budgeting and Financial Management. (SS)** Fund accounting for government; techniques of financial analysis, including break-even analysis, cost accounting, cash-flow analysis, and capital budgeting; and governmental budgeting, including the budgetary process and reforms, and the budget crunch in the public sector. One course. *Stubbing*

**242S. Chinese Economy in Transition. (SS)** Prerequisites: Economics 1 or 51, and 2 or 52. See C-L: Economics 242S; also C-L: Comparative Area Studies. One course. *Yang*

**243S. Media and Democratization in Russia. (SS)** Analysis of policy, content, and audiences of mass media in the Soviet Union and post-Soviet Russia. Focus on such issues as media access, media markets, television and electoral campaigns, and relationship to political authority. C-L: Political Science 276S. One course. *Mickiewicz*

**251S. Regulation of Vice and Substance Abuse. (SS)** Focus on activities that have traditionally been defined as vices (including drinking, smoking, use of opiates, gambling, pornography, prostitution) and the problems of regulating and controlling them in a free society. Evaluation of social costs and benefits of various alternative policy interventions. Prerequisite: Economics 149 or Public Policy Studies 110. C-L: Economics 251S. One course. *Cook*

**255S. Health Policy Analysis. (SS)** Group analysis of a current health-policy problem. Project involves background research, data acquisition, analysis, writing, and presentation of a substantial policy report. Designed for candidates seeking the undergraduate certificate in health policy. Consent of instructor required. C-L: Health Policy. One course. *Conover or Taylor*

**257. United States Policy in the Middle East. (SS)** From World War II to the present with a focus on current policy options. C-L: Comparative Area Studies and History 296. One course. *Kuniholm*

**258. International Environmental Regimes. (SS)** See C-L: Political Science 271; also C-L: Comparative Area Studies. One course. *McKean*

**259S. State and Local Public Finance. (SS)** Analysis of state and local revenue sources, intergovernmental fiscal relations, budgets and expenditures, fiscal aspects of economic development, and the municipal bond market. Policy topics include financing schools and transportation systems, tax policy, and current fiscal issues. Prerequisite: Public Policy Studies 217 or equivalent. C-L: Economics 259S. One course. *Ladd*

**260. Economic Policy Analysis of Nonrenewable Resources. (SS)** Economic analysis of nonrenewable resources, development, and exploration. Relationship between natural resources and other economic sectors. Emphasis on public policy tax and regulatory policy, natural resources in developing economies and foreign investment in the mining sector. Prerequisite: Economics 149, Public Policy Studies 110, or Public Policy Studies 232. C-L: Economics 260. One course. *Conrad*

**261. Evaluation of Public Expenditures. (SS)** Basic development of cost benefit analysis from alternative points of view, for example, equity debt, and economy as a whole. Techniques include: construction of cash flows, alternative investment rules, inflation adjustments, optimal timing and duration of projects, private and social pricing. Adjustments for economic distortions, foreign exchange adjustments, risk and income distribution examined in the context of present value rules. Examples and cases from both developed and developing countries. C-L: Economics 261, Environment 272, and Health Policy. One course. *Conrad*

**262S. Seminar in Applied Project Evaluation. (SS)** Initiate, develop, and perform a project evaluation. Range of topics include measuring the social cost of deforestation, the B1 Bomber, a child nutrition program, the local arts program. Prerequisite: Economics 285 or Public Policy Studies 261. C-L: Economics 262S. One course. *Conrad*

**264. Advanced Topics in Public Policy. (SS)** Selected topics. One course. *Staff*

**264S. Advanced Topics in Public Policy. (SS)** Selected topics. Seminar version of Public Policy Studies 264. One course. *Staff*

**266. Comparative Social Policy. (SS)** An examination of social and health policies in advanced industrial countries. Focus on understanding the comparative methods and role of the state, market, and voluntary sector in policy development and implementation. C-L: Canadian Studies, Comparative Area Studies, and Political Science 266. One course. *Staff*

**269S. The Regulatory Process. (SS)** Theories in economics, political science, and law to examine the structure, conduct, and performance of U.S. regulatory agencies. Emphasis on why decisions are delegated to agencies, the degree to which regulators behave strategically, and the impact of regulatory actions on society. Analysis of what is effective in a regulatory agency. C-L: Political Science 268S. One course. *Hamilton*

**271S. Schools and Social Policy. (SS)** Public schools as instruments of public policy. Economic and statistical analysis of the educational production process. Consideration of alternative school reforms. One course. *Ladd*

**272. Resource and Environmental Economics. (SS)** Prerequisite: introductory course in microeconomics. See C-L: Environment 270; also C-L: Economics 270. One course. *Kramer*

**274. Resource and Environmental Policy. (SS)** Development of a policy analysis framework for studying resource and environmental policy. Political institutions, interest group theory, public choice theory, role of economics in policy analysis, ethics and values. Application to current and historical United States policy issues. C-L: Environment 274. One course. *Staff*

**275S. Seminar in Urban Politics and Urban Public Policy. (SS)** See C-L: Political Science 274S. One course. *Orr*

**280S. Philanthropy, Voluntarism, and Not-for-Profit Management. (SS)** An examination of the role and functioning of the not-for-profit sector in relation to both the public sector and the private for-profit sector in dealing with significant social problems. C-L: Law 585S. One course. *Fleishman*

**282S. Seminar in North American Studies. (CZ)** See C-L: North American Studies 283S; also C-L: Cultural Anthropology 283S, History 283S, Political Science 285S, Romance Studies 283S, and Sociology 283S. One course. *Staff*

**283S. Congressional Policy-Making. (SS)** See C-L: Political Science 283S. One course. *Gronke*

**284S. Public Policy Process in Developing Countries. (SS)** Policy-making patterns in less developed countries; examples from Latin America, Africa, and Asia. C-L: Comparative Area Studies, Latin American Studies, and Political Science 284S. One course. *Ascher*

**285. Land Use Principles and Policy. (SS)** Consideration of four major roles of land in the United States: as a producer of commodities, financial asset, component of environmental systems, and location of development. Analysis of market allocation of land, market failure, role of public planning and regulation. C-L: Environment 285. One course. *Healy*

**286S. Economic Policy-Making in Developing Countries. (SS)** Fiscal, monetary, and exchange rate policies in less developed countries; issues in public policy toward natural resources and state-owned enterprises. Prerequisite: Economics 149 or Public Policy Studies 110. C-L: Comparative Area Studies, Economics 286S, and Latin American Studies. One course. *Conrad or Ramachandran*

**288S. Current Issues in United States Federal Tax Policy. (SS)** Prerequisite: Economics 149 or consent of instructor. See C-L: Economics 288S. One course. *Staff*

**290S. Glasgow Seminar in Public Policy. (SS)** Analysis of the British political system and important public policy problems in Britain including: privatization, Britain and the European community, and economic and social policy. (Taught in Scotland.) Prerequisites: Public Policy Studies 55D, two of the core courses (PPS 110, 112, 114, or 116), and consent of director of undergraduate studies. One course. *Staff*

### **Skills Courses**

**81. Essentials of Public Speaking.** Basics of and practice in oral presentations, with particular attention to the gathering and organization of speech materials. Preference given to freshmen and sophomores. Does not apply toward public policy studies major. Consent of instructor required. One course. *O'dor*

**82. Essentials of Public Speaking.** Similar to Public Policy Studies 81, but for juniors and seniors. Not open to students who have taken Drama 81 or 82, or Public Policy Studies 81. Does not apply toward public policy studies major. One course. *O'dor*

**83S. Argumentation.** Analysis, investigation, evidence, reasoning and refutation, and other communication strategies. Consent of instructor required. Does not apply toward public policy studies major. One course. *O'dor*

### Courses Currently Unscheduled

**112. Statistics and Public Policy. (QR)**

**175S. The Palestine Problem and United States Public Policy. (CZ)**

**179S. Refugees and World Politics. (SS)**

**185. American Diplomacy from the Kennedy Administration to the Present. (SS)**

**186S. Shaping the News. (SS)**

**188. The Psychology of Political Symbols. (SS)**

**204S. Ethics in Political Life. (SS)**

**221. Decision Analysis for Public Policymakers. (SS)**

**237. Public Management II: Managing Public Agencies. (SS)**

**240S. Analyzing the News. (SS)**

**241. Reporting the American People. (SS)**

**245S. Leadership Tutorial. (SS)**

**253. The Politics of Health Care. (SS)**

**265S. The Process of International Negotiation. (SS)**

**267S. Policy-Making in International Organizations. (SS)**

### THE MAJOR

The public policy studies major is an interdisciplinary social science program designed to provide students with the skills, analytical perspectives, and descriptive information needed to deal effectively with major contemporary social problems. The course of study familiarizes the student with the kind of contribution each of several disciplines (political science, economics, social psychology, applied mathematics, history, and ethics) can make to one's understanding of contemporary policy issues such as air pollution, crime, health, and international trade disputes. Opportunities are provided, both in the classroom and through field experiences, for students to integrate this material and apply it to the analysis of specific public policy issues.

Students majoring in public policy participate in a variety of learning experiences including seminars, lecture and discussion classes, individual study, policy workshops, and a required internship (see below). In addition, students are urged to participate actively in programs sponsored by the Sanford Institute of Public Policy to supplement material covered in class. As a matter of policy, students are asked to evaluate teaching and course content and are provided both formal and informal opportunities to shape the program and curriculum.

*Prerequisites.* Economics 2D or 52D; Political Science 90A, 91, 101 or equivalent; and Public Policy Studies 55D.

*Major Requirements.* Public Policy Studies 110, 112, 114, 116, plus four 100/200-level elective courses; one of these must be a 200-level course. Statistics 110C, Statistics 110A, Statistics 110B, Statistics 112, Statistics 10D, or Political Science 138 is an acceptable substitute for Public Policy Studies 112. Economics 149 is an acceptable substitute for Public Policy Studies 110. Political Science 90A, 91, 101 or equivalent is a prerequisite for Public Policy Studies 114. A satisfactory policy-oriented field experience approved by the assistant director of internships is required.



## INTERNSHIP PROGRAM

The Public Policy Studies internship program provides students with an opportunity to develop a basic understanding of one or more policy areas, to apply that understanding in an internship during the summer (typically between the junior and senior year), and to return to the classroom to build on that knowledge and experience.

Students may elect to complete a "sequence" internship in one of the following policy topic areas: administration of justice, international policy, environmental policy, state and local policy, free press and public policy, telecommunications policy, and health policy. Students enroll in a pre-internship course in the selected policy area during the spring of the junior year. The pre-internship course serves as preparation for the ten-week internship experience, which usually begins in late May or early June and runs through mid-August. Sequence internships are conducted in all policy areas in Washington, D.C. In addition, state and local policy and administration of justice sequence internships are conducted in the Research Triangle Park area of North Carolina. Interns in each policy area are required to enroll in a summer seminar conducted on-site (either in Washington, D.C. or in the Research Triangle Park area). The summer seminar is taken on a pass-fail basis for either half or full course credit. Stipends are provided for all public policy studies majors participating in the sequence internship experience, i.e., enrollment in a pre-internship course in one of the above policy topic areas and enrollment in a summer sequence seminar. Those students receiving payment for their summer internships are not eligible for the stipend.

Alternatively, students can design their own "independent" internship, with the advice and approval of the Public Policy Studies assistant director for internships. There is no predesignated internship course in this case, but each student is strongly encouraged to choose at least one course providing appropriate preparation for the summer experience. Likewise, there is no required summer seminar on-site, nor is there a stipend. Independent interns who wish to receive course credit can enroll (pass/fail basis) in Public Policy Studies 190.

In order to participate in an internship, all Public Policy Studies majors must have completed Public Policy Studies 55D and three of the four core courses (Public Policy Studies 110, 114, 116, or Statistics 110C or equivalent). This requirement may be waived by the director of undergraduate studies for transfer students or others in unusual circumstances. The application process for either a sequence or an independent internship is completed during the fall semester of the junior year. Students studying abroad can complete the application process in the spring semester of the junior year. All internship applications must be approved by the assistant director for internships.

Public Policy Studies majors are strongly encouraged to take an advanced follow-up course that augments the knowledge gained from their internship experience.

### Graduation with Distinction

For graduation with departmental distinction students are required to complete an honors seminar and an honors project. To be awarded *distinction*, a student must receive no less than an A- on the research paper and have a final 3.5 grade point average in the public policy studies major. If a student is judged to have done a clearly superior research project, as evidenced by a grade of A or A+, and if the 3.5 major grade point average requirement is met, *Highest Distinction* in Public Policy is awarded. The proposed program of research must be approved in advance by the director of undergraduate studies.

## Religion (REL)

Professor Lawrence, *Chair*; Associate Professor Martin, *Director of Undergraduate Studies*; Professors Clark, Corless, Hillerbrand, Kort, C. Meyers, E. Meyers, Sanders, Surin (literature), and Wintermute; Associate Professors Bland and Peters; Assistant Professors Cornell, Hart,

Joyce, and Nickerson. *Affiliated faculty*: Professor Aers (English) and Associate Professor Beckwith (English)

A major or minor is available in this department.

Study in the Department of Religion arises from the recognition that religion, although it takes many forms, is a constitutive element of human existence individually and collectively. The curriculum is organized so that courses at the 40 level provide an introduction to the major religious traditions, those with significant representation and influence throughout the world. Courses at the 100 level are divided into those which focus on specific traditions, texts, and contexts and those which deal with religious data from a theoretical perspective.

All introductory courses and courses at the 100 level, with the exception of those courses specially designated, are open to all undergraduates. Courses at the 200 level are open to upperclass students with the consent of the instructor.

**20S. Special Topics in Writing.** One course. *Staff*

## GLOBAL RELIGIONS

**40. Judaism. (CZ)** Introduction to Judaic civilization from its origins to modern times. Not open to students who have taken Religion 51. C-L: Judaic Studies and Women's Studies. One course. *Staff*

**41. Christianity. (CZ)** Introduction to Christianity in history and modern times. One course. *Hillerbrand or staff*

**42. Islam. (CZ)** Introduction to Islam in history and modern times. One course. *Cornell or Lawrence*

**43. Hinduism. (CZ)** Introduction to Hinduism in history and modern times. One course. *Staff*

**44. Buddhism. (CZ)** Introduction to Buddhism in history and modern times. Not open to students who have taken Religion 149. One course. *Corless or staff*

**45. Religions of Asia. (CZ)** Problems and methods in the study of religion, followed by a survey of the historical development, beliefs, practices, and contemporary significance of the Islamic religion and religions of south and east Asia. Not open to students who have taken Religion 57. C-L: Comparative Area Studies. One course. *Cornell, Lawrence, Nickerson, or staff*

**46. Religions of China and Japan. (CZ)** Traditional religion in China and Japan and its interaction with Sino-Japanese Buddhism. Not open to students who have taken Religion 141. C-L: Comparative Area Studies. One course. *Nickerson*

**47. Taoism. (CZ)** Introduction to Taoism in history and modern times in mainland China and Taiwan. One course. *Nickerson*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**71A, 72A. Seminar for First- and Second-Year Students: Global Religions. (CZ)** Topics and instructors to be announced. One course each. *Staff*

**71B, 72B. Seminar for First- and Second-Year Students: Traditions, Texts, and Contexts. (CZ)** Topics and instructors to be announced. One course each. *Staff*

**71C, 72C. Seminar for First- and Second-Year Students: Theoretical Perspectives. (CZ)** Topics and instructors to be announced. One course each. *Staff*

## TRADITIONS, TEXTS AND CONTEXTS

**100. The Old Testament/Hebrew Bible. (CZ)** Historical, literary, and theological investigations. Not open to students who have taken Religion 50. C-L: Judaic Studies. One course. *C. Meyers, E. Meyers, Peters, or Winternute*

**101A. Selected Studies in the Bible: Pentateuch. (CZ)** Analysis and interpretation of major themes and figures, with special consideration of the narratives dealing with human and Israelite origins. Not open to students who have taken Religion 100. C-L: Judaic Studies. One course. *Staff*

**101B. Selected Studies in the Bible: Prophets. (CZ)** Analysis and interpretation of representative issues and personalities in the historical and prophetic books. Not open to students who have taken Religion 101. C-L: Judaic Studies. One course. *Staff*

**101C. Selected Studies in the Bible: Writings. (CZ)** Analysis and interpretation of representative forms and ideas, with particular attention to wisdom literature and psalms. Not open to students who have taken Religion 102. C-L: Judaic Studies. One course. *Staff*

**102. The New Testament. (CZ)** Origins, development, and content of thought. Not open to students who have taken Religion 52. One course. *Martin, Sanders, or staff*

**103. Islam in East and Southeast Asia. (CZ)** The development of Islam and Islamic civilization in Southeast and Eastern Asia from the rise of Islam to modern times. C-L: Comparative Area Studies. One course. *Cornell*

**104. Religion in the West. (CZ)** Judaism, Christianity, and Islam in their historical and cultural contexts, with their precursors and successors. Not open to students who have taken Religion 56 (Religion in the West). One course. *Corless*

**106. Jesus and the Synoptic Gospels. (CZ)** The gospel tradition in the New Testament. One course. *Staff*

**109. Women in the Biblical Tradition: Image and Role. (CZ)** See C-L: Judaic Studies; also C-L: Women's Studies. One course. *C. Meyers*

**111. The Historical Jesus. (CZ)** Historical research on the life of Jesus. One course. *Martin or Sanders*

**112. Muslim Minorities in Society: From Asia to America. (CZ)** The historical formation, legal status, and political options of Muslim minorities in non-Muslim nation-states. Special attention to China, the Philippines, India, Europe, and North America. Intra-Muslim and international perspectives, looking at the networks of exchange and communication since the end of colonialism. C-L: Comparative Area Studies. One course. *Cornell and Lawrence*

**115-116. Introduction to Biblical Hebrew. (FL)** (Divinity School courses open to undergraduates with consent of instructor.) Elements of phonology, morphology, and syntax. Exercises in reading and writing Hebrew. 116: study of the weak verb; exegetical treatment of the Book of Jonah. C-L: Judaic Studies. Two courses. *Staff*

**117. Mahayana Buddhism. (CZ)** Special features of the doctrine and practice of Buddhism in Tibet, China, Korea, and Japan, with an account of their origins in the Indian subcontinent. One course. *Corless*

**118. Anthropological Approaches to Religion. (SS)** See C-L: Cultural Anthropology 161. One course. *Ewing*

**119. Muslim World: Transformations and Continuities. (SS)** See C-L: Cultural Anthropology 126; also C-L: Comparative Area Studies, and Women's Studies. One course. *Ewing*

**120. History of the Christian Church. (CZ)** Crucial events, issues, structures, and writings that have shaped the Christian community and influenced Western civilization from the time of the early church to the present. C-L: History 156B. One course. *Hillerbrand*

**121. Roman Catholic Tradition. (CZ)** History of the tradition from early days through the reforms of Vatican II with emphasis on the experiences of American Catholics, concluding with a discussion of current concerns about gender equality, sexuality, and the post-Vatican II crisis of authority. Not open to students who have taken Religion 53. One course. *Joyce*

**124. Religion in American Life. (CZ)** A historical survey, with emphasis on the ways that religious experiences, beliefs, and traditions have found expression in religious communities and institutions, and in American public life. One course. *Joyce*

**125. Women and Sexuality in the Christian Tradition. (CZ)** A historical survey of Christian attitudes and practices from New Testament times to the present. C-L: Comparative Area Studies, Study of Sexualities, and Women's Studies. One course. *Clark*

**128. Christians in Crisis. (CZ)** Christian thought and debate on, and theological analysis of, such contemporary issues as abortion, creationism, homosexuality, liberation, poverty, racism, and sexism. One course. *Staff*

**130. Late Antique Christian Art. (AL)** See C-L: Art History 130; also C-L: Classical Studies 130. One course. *Wharton*

**133. The Foundations of Post-Biblical Judaism. (CZ)** History, religion, and literature of Pharisaic and sectarian Judaism from the time of Ezra to Rabbi Judah. C-L: Judaic Studies. One course. *E. Meyers*

**134. Jewish Mysticism. (CZ)** The main historical stages, personalities, texts, and doctrines from rabbinic to modern times. C-L: Comparative Area Studies, Judaic Studies, and Medieval and Renaissance Studies. One course. *Bland*

**135. Jewish Religious Thought. (CZ)** Doctrines, dialectics, and religious attitudes of pre-Enlightenment theologians. C-L: Comparative Area Studies, Judaic Studies, and Medieval and Renaissance Studies. One course. *Bland*

**136. Contemporary Jewish Thought. (CZ)** Modern Jewish thought from Mendelssohn to the present, with particular reference to American thinkers. C-L: Comparative Area Studies and Judaic Studies. One course. *Bland or E. Meyers*

**138. Women and Religion in America. (CZ)** Women's religious experience in America, from the lives of early American "good wives" to the work of Catholic nuns in the nineteenth century and the spirituality of Jewish feminists in modern America, concluding with a discussion of contemporary issues, for example, feminist theology, sexuality, and admission of women to pastoral leadership. Not open to students who have taken Religion 118. C-L: Study of Sexualities and Women's Studies. One course. *Joyce*

**139. Women in Islam: Fact and Fiction. (CZ)** See C-L: Asian and African Languages and Literature 190; also C-L: African and African-American Studies 160, Comparative Area Studies, and Women's Studies. One course. *Cooke*

**144, 145. Introduction to the Civilizations of Southern Asia. (CZ)** Not open to students who have taken Religion 160, 161. See C-L: Asian and African Languages and Literature 160, 161; also C-L: Comparative Area Studies, Cultural Anthropology 101, 102, and History 193, 194. One course each. *Khanna*



**146, 147. Introduction to Islamic Civilization. (CZ)** Extensive survey of Muslim peoples and institutions. 146: the Middle Eastern origins and cultural attainments of medieval Islam. 147: modern developments and global features of the Islamic world. Not open to students who have taken Religion 162, 163. C-L: Comparative Area Studies, Cultural Anthropology 147, 148, History 101G, 102G, and Medieval and Renaissance Studies. One course each. *Cornell, Lawrence, and staff*

**148. Alternative Religion in America. (CZ)** Focus on both the historical development of particular traditions (for example, Mormon, Adventist, New Age) and general themes in American religious life (for example, relationship between religion and health, appeal of communitarian and millenarian movements). One course. *Joyce or staff*

**149. Introduction to Christian Theology and Ethics. (CZ)** Analysis and interpretation of faith and practice. Not open to students who have taken Religion 59. One course. *Kort or staff*

**150. Mysticism. (CZ)** The mystical element of religion: Hinduism, Buddhism, Christianity, and Islam. Not open to students who have taken the former Religion 143 (Mysticism). C-L: Comparative Area Studies. One course. *Staff*

**152A. Islamic Mysticism: Arabic (Western) Tradition. (CZ)** Sufism as an ascetical protest movement that affected the growth of Islam. C-L: African and African-American Studies 151 and Comparative Area Studies. One course. *Cornell*

**152B. Islamic Mysticism: Perso-Indian (Eastern) Traditions. (CZ)** Sufism as an ascetical protest movement that affected the worldwide growth of Islam. C-L: Comparative Area Studies. One course. *Lawrence*

**154. African-American Religion and Identity. (CZ)** Religious formation of African-American identity, from slavery to the present time; focus on the diverse religious traditions of the African diaspora—including Vodun, Santeria, Judaism, Christianity, and Islam. C-L: African and African-American Studies 152. One course. *Hart*

**158. The Reformation of the Sixteenth Century. (CZ)** A survey of the changes in sixteenth-century European society, with particular reference to the continent, which grew out of the movement for religious reform and renewal. Focus on new developments in theology and religion and their relationship to society. Not open to students who have taken Religion 167. C-L: Comparative Area Studies, History 156A, and Medieval and Renaissance Studies. One course. *Hillerbrand*

## **THEORETICAL PERSPECTIVES**

**160. Religion and Spirituality in the African Diaspora. (CZ, SS)** See C-L: African and African-American Studies 150; also C-L: Cultural Anthropology 150. One course. *Daniels*

**165. Religion and Psychology. (SS)** Contributions of major psychological theories to an understanding of religion, especially Christianity. Not open to students who have taken Religion 61. One course. *Staff*

**171. Religion and Society. (CZ)** Introduction to the interface between religion and its social contexts. Issues such as social organizations, politics, systems of value, and the arts from a global and comparative perspective. Not open to students who have taken Religion 63. One course. *Staff*

**173. Religious Movements. (CZ, SS)** See C-L: Cultural Anthropology 138. One course. *Ewing*

**174. Apocalypse Then and Now: Ancient and Modern Apocalypticism. (CZ)** An interdisciplinary examination of ancient Jewish and Christian apocalypticism combined

with study of occurrences of apocalyptic images and themes in modern fiction, politics, art, film, and social movements. The various functions of apocalyptic in ancient and modern cultures and conflicts. Not open to students who have taken Religion 104. One course. *Martin*

**175. Archaeology and Art of the Biblical World. (AL, CZ)** The material culture of ancient Palestine as it relates to the Hebrew Bible, the New Testament, and early Judaism. Not open to students who have taken Religion 110. C-L: Comparative Area Studies and Judaic Studies. One course. *C. Meyers or E. Meyers*

**176. Principles of Archaeological Investigation. (CZ)** Supervised fieldwork, visits to other excavations, introduction to ceramic chronology, numismatics, and other related disciplines. Excavation of a late Roman village in Galilee. Offered in Israel, only in the summer. Not open to students who have taken Religion 131D. C-L: Judaic Studies. One course. *C. Meyers or E. Meyers*

**177. Perspectives in Archaeology. (CZ)** Major trends and issues in archaeology, literature and material culture, history and process, and applications of archaeology to modern society. Focus on the material remains of the past and traditional and modern methods of their analysis. May be offered abroad in Duke's Summer Program in Israel or Greece. Not open to students who have taken Religion 99. C-L: Classical Studies 99 and Judaic Studies. One course. *C. Meyers, E. Meyers, Younger, and staff*

**178. Moses, Socrates, Buddha, Jesus, Gandhi. (CZ)** A critical study of paradigmatic individuals—figures who are held to exemplify the virtues or whose lives are held up as examples for others to follow, and of virtue, ethics, politics, and social criticism. One course. *Hart*

**179S. Ethical Issues in Twentieth-Century America. (CZ)** A critical examination of ethical themes, with special emphasis on public policy. For participants in the Twentieth-Century America FOCUS Program only. Not open to students who have taken Religion 114S. One course. *Hart*

**180. Ethical Issues in the Life Cycle. (CZ)** Human development viewed in religious, ethical, and psychological perspectives. Not open to students who have taken Religion 155. One course. *Staff*

**181. Ethical Issues in Social Change and Public Policy. (CZ)** American moral tradition and factors in social change in the normative analysis of public policy, with a consideration of specific ethical issues. Not open to students who have taken Religion 151. One course. *Staff*

**182. Medicine and Religion in American Society. (CZ)** Religious, social, and cultural understandings of pain and suffering, disease, mental illness, sexuality and sexualities, abortion, and euthanasia. Not open to students who have taken Religion 159. C-L: Study of Sexualities. One course. *Joyce*

**183. Comparative Approaches to Global Issues. (CZ, SS)** Not open to students who have taken Religion 121. See C-L: Comparative Area Studies 125; also C-L: Cultural Anthropology 125, History 137, Perspectives on Marxism and Society, Political Science 125, and Sociology 125. One course. *Staff*

**184. Religion and Film. (CZ)** A study of the relationship of motion pictures and religion. The inquiry will focus on the portrayal of organized religion; expressions of religious life; and religious topics, such as God, evil and morality, in motion pictures. Not open to students who have taken Religion 62. C-L: Film and Video. One course. *Hillerbrand*

**185. Special Topics in Religion.** Topics vary from semester to semester. One course. *Staff*

**185S. Special Topics in Religion.** Seminar version of Religion 185. One course. *Staff*

**186. The Theology and Fiction of C. S. Lewis.** (AL, CZ) A study of texts of cultural criticism, fantasy fiction, and theological and moral argument by C. S. Lewis, their dependence on the cultural situation in which they were deployed, and the reasons for their continuing force and wide appeal. One course. *Kort*

**188. Religion in Recent American Fiction.** (AL, CZ) Religious elements in recent literature. One course. *Kort*

**191, 192. Independent Study.** For freshmen and sophomores with departmental approval. One course each. *Staff*

**193, 194. Independent Study.** For juniors and seniors with departmental approval. One course each. *Staff*

**195A, 196A. Junior-Senior Seminars: Global Religions.** (CZ) Topics and instructors to be announced. One course each. *Staff*

**195B, 196B. Junior-Senior Seminars: Traditions, Texts, and Contexts.** (CZ) Topics and instructors to be announced. C-L: Judaic Studies. One course each. *Staff*

**195C, 196C. Junior-Senior Seminars: Theoretical Perspectives.** (CZ) Topics and instructors to be announced. One course each. *Staff*

**197-198. Honors Research.** Consent of the director of undergraduate studies required. Two courses. *Staff*

**199. Colloquium for Majors.** A survey of currently important theories of religion and methodologies employed in the study of religion. Restricted to majors. One course. *Hillerbrand*

### **For Seniors and Graduates**

**201. Studies in Intertestamental Literature.** (CZ) Selected documents of the Apocrypha and Pseudepigrapha examined exegetically and theologically in their relation to postexilic Judaism. Consent of instructor required. One course. *Wintermute*

**204. Origen.** (CZ) The systematic and apologetic writings of an important Alexandrian thinker and exegete of the third century. One course. *Clark*

**207. Hebrew Prose Narrative.** (FL) Focus on the grammar, syntax, and prose style of classical Hebrew composition; a comparative reading of modern and precritical Jewish and Christian commentary. Readings spanning the spectrum from the early Hebrew prose of Genesis and I and II Samuel to the late compositions of Chronicles and Ezra-Nehemiah. One year of classical Hebrew required. C-L: Judaic Studies and OT 207. One course. *Staff*

**208. Classical Hebrew Poetry: An Introduction.** (FL) The problem of defining and understanding what is "poetic" in classical Hebrew. Theories of Hebrew poetry from Lowth to Kugel and O'Connor illustrated with readings from Psalms, Isaiah, Job, and Jeremiah. One year of classical Hebrew required. C-L: Judaic Studies and OT 208. One course. *Staff*

**212. Theories of Religion.** (CZ) Late nineteenth- and twentieth-century theories, interpretations, and approaches to the study of religion. One course. *Cornell or Hart*

**217. Islam and Islamic Art in India.** (AL, CZ) To engage and enjoy the intellectual and social history and the religious, literary, and aesthetic legacy of the several Muslim communities of South Asia. Focus on the major creative saints/scholars/leaders of institutional Sufism. Includes a gallery field trip. C-L: Art History 217 and Comparative Area Studies. One course. *Lawrence*

- 220. Rabbinic Hebrew.** (FL) Interpretive study of late Hebrew, with readings from the Mishnah and Jewish liturgy. C-L: Judaic Studies. One course. *E. Meyers or staff*
- 224B. Comparative Semitic II.** (FL) An introduction to the morphology and syntax of classical Arabic and the Semitic languages of Palestine-Syria, together with a consideration of their relationships to Hebrew. One course. *Wintermute*
- 226B. Exegesis of the Greek New Testament (Romans).** (CZ) Consent of instructor required. One course. *Staff*
- 226F. Exegesis of the Greek New Testament (I and II Corinthians).** (CZ) Consent of instructor required. One course. *Staff*
- 229S. Old Church Slavonic.** (FL) See C-L: Russian 203S; also C-L: Linguistics. One course. *Staff*
- 230. Sainthood in Comparative Perspective.** (CZ) Examination of sainthood, saint cults, and sacred biography from a multidisciplinary and global perspective. One course. *Cornell*
- 231S. Seminar in Religion and Contemporary Thought.** (CZ) Analytical reading and discussion of such critical cultural analysis as is found in the works of Polanyi, Arendt, Trilling, and others, with appraisal of the relevance of theological inquiry. One course. *Staff*
- 232S. Religion and Literary Studies.** (AL) Theories concerning the relation of religion to literary forms, particularly narrative. One course. *Kort*
- 233. Modern Fiction and Religious Belief.** (AL) A study of kinds of religious meaning or significance in representative American, British, and continental fiction of the first half of the twentieth century. One course. *Kort*
- 234. Early Christian Asceticism.** (CZ) The development of asceticism and monasticism in the first six centuries of Christianity. C-L: Women's Studies. One course. *Clark*
- 235. Heresy: Theological and Social Dimensions of Early Christian Dissent.** (CZ) One course. *Clark*
- 241. Classical Islamic Theology and Ethics.** (CZ) Topics include unity of God, free will and predestination, nature of divine revelation, Aristotelian and Neoplatonic influences on Islamic thought, Sunni "orthodoxy," Andalusian peripateticism, Islamic monism, ethical rationalism, ethical voluntarism, and Islamic moral philosophy. C-L: African and African-American Studies 241. One course. *Cornell*
- 244. Archaeology of Palestine in Hellenistic-Roman Times.** (CZ) The study of material and epigraphic remains as they relate to Judaism in Hellenistic-Roman times, with special emphasis on Jewish art. C-L: Judaic Studies. One course. *E. Meyers*
- 245. Special Topics in Religion.** (CZ) Subject varies from semester to semester. One course. *Staff*
- 248. Theology of Karl Barth.** (CZ) A historical and critical study of Barth's theology. One course. *Staff*
- 253. Feminist Theory and the Study of Christianity.** (CZ) Nineteenth- and twentieth-century feminist theories and their implications for Christian doctrine and biblical interpretation. C-L: Women's Studies. One course. *Clark and McClintock-Fulkerson*
- 254. Justice, Law, and Commerce in Islam.** (CZ) Islamic approaches to the legal and ethical regulation of social life. C-L: African and African-American Studies 254 and Law 568. One course. *Cornell*



258. **Coptic. (FL)** Introduction to the Sahidic dialect with selected readings from Christian and Gnostic texts. Prerequisite: one year of Greek or consent of instructor. One course. *Wintermute*

262. **Special Topics in Gender and Religion. (CZ)** Study of gender and sexualities; emphasis on cultural and social constructions of womanhood, masculinity, and sexual identities in the American context. C-L: Study of Sexualities and Women's Studies. One course. *Joyce*

274A. **Philosophies, Sciences, and Theologies of the European Enlightenment: Descartes to Kant. (CZ)** Western theological thought since the Scientific Revolution, with emphasis on developments and movements that occurred in the seventeenth and eighteenth centuries. Descartes, Locke, Leibniz, Spinoza, Hume, Vico, Lessing, Herder, and Kant. One course. *Surin or staff*

284. **The Religion and History of Islam. (CZ)** Origins and development of the Islamic community and tradition, with particular attention to the religious element. C-L: Comparative Area Studies. One course. *Cornell or Lawrence*

#### COURSES CURRENTLY UNSCHEDULED

108. **The Life and Letters of Paul. (CZ)**

123. **Issues in Early Christian History. (CZ)**

126. **Russian Orthodoxy. (CZ)**

127. **Protestant Traditions. (CZ)**

132D. **Palestine in Late Antiquity. (CZ)**

137. **An Introduction to Judaism in the Greco-Roman World. (CZ)**

140. **Religions of India. (CZ)**

143. **History and Religions of North Africa. (CZ)**

170. **Problems of Religious Thought. (CZ)**

187. **Atmosphere and Mystery in Twentieth-Century English Fiction. (AL)**

189. **Autobiography and Religious Identity. (CZ)**

190S. **The Family in Christian History. (CZ)**

202. **Language and Literature of Dead Sea Scrolls. (CZ)**

216. **Syriac. (CZ)**

218. **Religions of East Asia. (CZ)**

219. **Augustine. (CZ)**

221. **Readings in Hebrew Biblical Commentaries. (CZ)**

224A. **Comparative Semitic I. (FL)**

228. **Twentieth-Century Continental Theology. (CZ)**

238. **Witchcraft in New England. (CZ)**

239. **Introduction to Middle Egyptian I. (FL)**

240. **Introduction to Middle Egyptian II. (FL)**

243. **Archaeology of Palestine in Biblical Times. (CZ)**

261. **Islam in the African-American Experience. (CZ)**

264. **The Sociology of the Black Church. (SS)**

274B. **Philosophies, Sciences, and Theologies after the European Enlightenment: Schleiermacher to Troeltsch. (CZ)**

275S. **Topics in Early Christian and Byzantine Art. (AL)**

277. **Judaism in the Greco-Roman World. (CZ)**

280. **The History of the History of Religions. (CZ)**

283. **Islam and Modernism. (CZ)**

288. **Buddhist Thought and Practice. (CZ)**

297. **Philosophical and Theological Discourses on Modernity. (CZ)**

## THE MAJOR

*Major Requirements.* Ten courses, at least eight of which must be at the 100-level, including a small group learning experience—a junior-senior seminar, a 200-level course, independent study (Religion), a departmental honors project (Religion), or the Colloquium for Majors (Religion 199). The student, in consultation with an assigned advisor and with the advisor's approval, will select at least one course apiece for each of three different religions and will choose a set of four courses which constitute a thematic or methodological focus on a particular aspect of religion.

### Graduation with Distinction

The Department of Religion has a program for Graduation with Distinction (see the bulletin under that heading). This program is intended for the outstanding religion major who has demonstrated the desire and talent to pursue independent research. The student, under supervision by an advisor, will produce a thesis of exceptional quality.

## THE MINOR

*Requirements.* The religion minor offers students specializing in another department or program the opportunity to enrich their studies with a wider perspective in religions. The requirements consist of a minimum of five religion courses, at least four of which must be at the 100-level or above.

### Foreign Languages

To prepare for graduate or professional study of religion, the department recommends that students complete at least four courses in college level study, or the equivalent, of a foreign language. Master of Arts and Doctor of Philosophy programs often require examination in one or two foreign languages. Students planning to attend a theological seminary should note that knowledge of biblical languages, as well as Latin, frequently is presupposed or required. Those planning to pursue studies of Asian religions should begin appropriate language study as part of their undergraduate preparation.

## Reserve Officer Training Corps (ROTC)

See Aerospace Studies—Air Force ROTC, Military Science—Army ROTC, and Naval Science—Navy ROTC.

## Romance Studies (RS)

Professor Mignolo, *Chair*; Associate Professor Vilarós, *Director of Undergraduate Studies*; Professors Bell, Caserta, Garci-Gómez, Jameson, Kaplan, Moi, Orr, Osuna, Pérez-Firmat, Stewart, Tetel, and Thomas; Associate Professors Finucci, Greer, Longino, Moreiras, Sieburth, and Solterer; Assistant Professors Fischer, Jonassaint, and Nouzeilles; Associate Professor of the Practice and Director of French Language Programs Tufts; Assistant Professor of the Practice and Director of the Spanish Language Program Caballero; Assistant Professor of the Practice of Portuguese Damasceno; Research Professor Dorfman; Research Associate Professor Keineg; Adjunct Associate Professor Byrd

Majors (in French Studies, Italian Studies, and Spanish) and minors are available in this department.

French, Italian, and Spanish 22, 76, or an Achievement or Placement Test score of 600 in French, 600 in Italian, and 630 in Spanish, or a SAT II score of 640 in French, 630 in Italian, or 660 in Spanish, are prerequisites for all courses at or above the 100 level not taught in English. Students who by reason of foreign residence have had special opportunities in French, Italian,

or Spanish must be classified by the director of undergraduate studies. The accelerated language courses 21 and 22 provide an introduction to the language. They are recommended for students who wish to acquire proficiency in a second foreign language before entering graduate school. In literature, one credit is granted for a score of 4 and two credits for a score of 5 (French or Spanish 70, 71) on the examination of the advanced placement program. In language, one advanced placement credit (French or Spanish 76) is granted for scores of 4 and 5.

## **FRENCH (FR)**

**1-2. Elementary French. (FL)** Understanding, speaking, reading, and writing French. Language laboratory for recording-listening practice. Two courses. *Staff*

**12. Review of Elementary French. (FL)** Intensive review of first-year French. Open only to students with a placement or achievement score of 380-440. May not be taken for credit by students who have taken 1-2. One course. *Staff*

**14. Intensive Study of French. (FL)** Covers the entire program of elementary French study in one semester using a media-based approach. Primary focus on oral skill development, with additional work on reading and writing. Two courses. *Staff*

**15. Intensive French. (FL)** Covers the entire program of intermediate language study in one semester using a media-based approach. Continued emphasis on oral skill development and the introduction of progressively longer and more challenging reading and writing activities. Prerequisite: French 14 or the equivalent. Two courses. *Staff*

**21. Accelerated Elementary French. (FL)** Basic grammar structures in one semester; emphasis on oral work. Prerequisite: four semesters or the equivalent of another foreign language or consent of instructor. One course. *Staff*

**22. Accelerated Intermediate French. (FL)** Review of basic grammar; emphasis on reading, with some practice in writing. Prepares students to enroll in courses at the 100 level. Prerequisite: French 21 or consent of instructor. One course. *Staff*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**63. Intermediate French. (FL)** Grammar review, reading, and oral practice, including laboratory experience. Prerequisite: French 2, 12, or achievement or placement test score of 450-540. One course. *Staff*

**70, 71. Introduction to Literature.** One or two course credits for Advanced Placement in literature. One course each.

**76. Advanced Intermediate French. (FL)** Oral practice, reading, composition. Prerequisite: French 63 or achievement or placement test score of 550-590. One course. *Staff*

**100. Cultural and Literary Perspectives. (FL)** Designed to give students leaving intermediate French the reading and writing skills necessary to enter 100-level courses in French studies. A close reading of cultural and literary texts which focus on themes such as daily life, philosophy, art, etc. One course. *Staff*

**101. Advanced Grammar and Composition. (FL)** A systematic study of the structure of formal French. Practice in writing. Not open to students who have taken the course as French 110. One course. *Thomas or staff*

**104S. French for Current Affairs. (FL)** Problems and controversies in today's France. Readings, discussions, and exposés. Not open to students who have taken the course as French 111S. C-L: Comparative Area Studies. One course. *Keineg or staff*

**107. French Phonetics. (FL)** Sounds, rhythm, intonation. Individual practice in language laboratory. Readings in phonetic theory. Not open to students who have taken the course as French 117. One course. *Thomas*

**108. Advanced Translation and Stylistics. (FL)** Differences between French and English patterns of expression. Levels of usage. Practice in translation. Not open to students who have taken the course as French 118. Prerequisite: French 101 or equivalent or consent of instructor. C-L: Linguistics. One course. *Thomas or staff*

**109S. French for Business. (FL)** Current issues in French business and commerce. Not open to students who have taken the course as French 113S. C-L: Comparative Area Studies. One course. *Staff*

**111, 112. Introduction to French Literature. (AL, FL)** An introduction to the major writers of the French literary tradition. Selections and complete works of poetry, fiction, theater, and essay. 111: Middle Ages through the eighteenth century. 112: nineteenth and twentieth centuries. Lectures and discussions; short essays and tests. Conducted in French. Not open to students who have taken the courses as French 101, 102. One course each. *Staff*

**114S. Discussions of Readings. (AL, FL)** Selected topics. Open only to freshmen and sophomores. May be repeated. One course. *Staff*

**115. Topics in French Thought and Culture from the Middle Ages to 1900. (CZ, FL)** Topics such as class and social relationships; the nation and centralization; authority and the state; the rise of public education; language and centralization; history of ideas and mentalities; film and media. Readings in French from documents. May be repeated. One course. *Staff*

**116. Topics in Modern French Thought and Culture: 1900 to the Present. (CZ, FL)** Topics such as racism, colonialism and its aftermath; postwar ideology; women's movement; communication development; elitist technology; community and privacy; environmental issues. May be repeated. One course. *Staff*

**117S. Contemporary Ideas. (CZ, FL)** Readings and discussion of French works which have provoked political or intellectual thought in recent years. For freshmen and sophomores only. May be repeated. C-L: Comparative Area Studies. One course. *Staff*

**137. Aspects of Contemporary French Culture. (CZ, FL)** Offered only as part of summer program in Paris. C-L: Comparative Area Studies. One course. *Staff*

**139. French Civilization. (CZ, FL)** The institutions and culture of France from the Middle Ages to the present. Readings and discussions in French. C-L: Comparative Area Studies. One course. *Keineg or Tetel*

**140. France in the Making: Language, Nation, and Literary Culture in Premodern Europe. (CZ, FL)** Fifteenth-century France, a transitional world where a national language was crystallizing, ideas and images of French sovereignty were taking shape, and literature became a state affair. Urban theater, political polemics, Joan of Arc, courtly culture. C-L: Medieval and Renaissance Studies. One course. *Solterer*

**141S, 142S. French Literature. (AL, FL)** Topics to be announced. Open to juniors and seniors. One course each. *Staff*

**143. Aspects of French Literature. (AL, FL)** Concentration on single authors, genres, movements, or themes. Topics to be announced. Offered only as part of summer program in Paris. One course. *Staff*

**144. Medieval Fictions. (AL, FL)** Introduction to the literature and culture of medieval France. Topics include Old French and the rise of literacy, allegory, the invention of romantic



love, social class and literary taste, modern renditions of the premodern past. C-L: Medieval and Renaissance Studies. One course. *Solterer*

**145S. Topics in Renaissance Literature and Culture. (AL, FL)** Topics may include: women writers, love and self-knowledge, carnival and the grotesque, in search of Rome, text as political and religious pamphlet. C-L: Comparative Area Studies and Medieval and Renaissance Studies. One course. *Tetel*

**146S. Montaigne and Self-Portraiture. (AL, FL)** A reading of some *essais* in the light of the self-portrait in Renaissance art. C-L: Medieval and Renaissance Studies. One course. *Tetel*

**147. Seventeenth-Century Fictions of Women. (AL, FL)** Works by and about women in the early modern period taking into account the *querelle des femmes*, the *préciosité* movement, and women's contribution to the development of the novel and the epistolary genre. C-L: Women's Studies. One course. *Longino*

**148. French Drama of the Seventeenth Century. (AL, FL)** The political content of plays by Corneille, Molière and Racine, with relation to court culture, social movements, and to relations between the Court of Louis XIV and the Porte of the Ottoman Empire. C-L: Drama 171 and Medieval and Renaissance Studies. One course. *Longino*

**152. The Early French Novel. (AL, FL)** Origins and evolution of the novel in the seventeenth and eighteenth centuries: Madame de Lafayette, Marivaux, Prévost, Rousseau, Diderot, Laclos, Sade. One course. *Stewart*

**153. The French Enlightenment. (AL, FL)** Religion, politics, and philosophic and literary ideas of eighteenth-century France: Montesquieu, Voltaire, Rousseau, and others. C-L: Comparative Area Studies. One course. *Stewart*

**154S. Upheavals That Made Modern France. (CZ, FL)** See C-L: History 154B. One course. *Orr and Reddy*

**155. Insiders and Outsiders of Nineteenth-Century France. (AL, FL)** How France consolidated its social, literary, and cultural identity after the Revolution. Topics include peasants, the new bourgeois wealth, the emerging power of the "people," expansion to the New World and Africa, and sexual and gender definitions. Works by Chateaubriand, de Duras, Balzac, Hugo, and memoirs edited by Foucault. One course. *Orr*

**156. The Age of the Novel. (AL, FL)** Flaubert, Balzac, and Stendhal. One course. *Bell or Orr*

**159. Topics in Sexuality and Gender Studies. (AL, FL)** The study of differences redefined and questioned in terms of sexuality and social identities. Works may be by women or men writers, critics, sociologists, and thinkers from France and Francophone countries and include different historical periods. C-L: Women's Studies. One course. *Staff*

**162. French Drama of the Twentieth Century. (AL, FL)** A survey of literature for the stage from 1890 to the present. One play each of Claudel, Maeterlinck, Jarry, Giraudoux, Cocteau, Ghelderode, Anouilh, Montherlant, Sartre, Camus, Genet, Ionesco, Beckett, Pinget, Vian, and Arrabal. C-L: Drama 172. One course. *Tufts*

**163. World War II and French Film. (CZ, FL)** Film scripts, memoirs, novels, political and social history, and cinematic technique that inform the viewing of French films on World War II. Possible films to be viewed: Clément's *Jeux interdits*, Malle's *Au revoir les enfants* and *Lacombe Lucien*, Miller's *L'accompagnatrice*, Yanne's *Boulevard des hirondelles*, and Lanzmann's *Shoah*. One course. *Orr*

**164. French Cinema. (AL, FL)** Historical overview of French cinema from the beginning of the sound period (1930). Films by directors such as Clair, Renoir, Carné, Godard, Truffaut,

and Varda. Readings in the theory of cinema by French theorists. C-L: Film and Video. One course. *Bell*

**168. Francophone Literature. (AL, FL)** Modern literature in French from French-speaking Africa and the French Caribbean. Topics include tradition and modernity; colonization, cultural assimilation, and the search for identity; and women in changing contexts. Prerequisite: good knowledge of French. C-L: African and African-American Studies 138, Asian and African Languages and Literature 168, Canadian Studies, Comparative Area Studies, and Latin American Studies. One course. *Jonassaint or staff*

**169. The Contemporary Novel in French Canada. (AL, FL)** Major trends in the novel since World War II: social revolt, proletarianism, political and religious liberation, and rejection of the past. C-L: Canadian Studies and Comparative Area Studies. One course. *Keineg*

**170. Contemporary Culture Wars. (CZ, FL)** Contemporary French cultural problems such as immigration, historical memory, intimacy in a materialistic world, feminist critique, sexualities, AIDS, and the new Europe. Literary and historical texts, essays, and films will be used. One course. *Orr*

**191, 192. Independent Study.** Directed reading and research. Open only to qualified juniors by consent of instructor and director of undergraduate studies. One course each. *Staff*

**193, 194. Independent Study.** Directed reading and research. Open only to qualified seniors by consent of instructor and director of undergraduate studies. One course each. *Staff*

**195. Topics in French Literature and Culture. (AL, FL)** Topics to be announced. Offered only in the Duke in France Program. One course. *Staff*

**200S. Seminar in French Literature. (AL, FL)** Topics to be announced. One course. *Staff*

**210. The Structure of French. (FL)** Modern French phonology, morphology, and syntax. Readings in current linguistic theory. C-L: Linguistics. One course. *Thomas*

**211. History of the French Language. (FL)** The evolution of French from Latin to its present form; internal developments and external influences. C-L: Linguistics and Medieval and Renaissance Studies. One course. *Thomas*

**223. Semiotics for Literature. (AL)** Theoretical writings in general semiotics by Frege, Peirce, Saussure, Mukarovsky, and Morris and their applications for textual analysis of French literary works by representative contemporary critics such as Eco, Riffaterre, Corti, and Greimas. Taught in English. C-L: Literature 280. One course. *Thomas*

**240. Medieval Narrative. (AL, FL)** The language, literature, and culture of premodern France. Topics involve: literacy, fictionality, allegory. Major writers include Chrétien de Troyes, Guillaume de Machaut, Christine de Pizan, Alain Chartier. C-L: Medieval and Renaissance Studies. One course. *Solterer*

**256. Modern Literature and History. (AL, CZ)** The interaction of history and literature in a particular period, for example: the occupation of France, the French Revolution. Problems of interpretation, historical memory, social identity, and narrative. C-L: Comparative Area Studies and History 256. One course. *Kaplan, Orr, or staff*

**258. The Narrative of Social Crisis. (AL, FL)** Realism and naturalism, with special emphasis on Balzac, Flaubert, and Zola. One course. *Bell, Jameson, or Orr*

**261. French Symbolism. (AL, FL)** Poetry and theories of Baudelaire, Mallarmé, and Rimbaud. Decadence: Lautréamont and Laforgue. One course. *Thomas*

**264. Contemporary French Poetry. (AL, FL)** The language of poetry. A chronological and theoretical approach to the major poets and movements since 1950. Selections from Bonnefoy, Char, Daive, Deguy, Dupin, Jabès, Jaccottet, Faye, Guillevic, Michaux, Meschonnic, Noël, Oulipo, Ponge, Stefan, Tortel, and others. One course. *Orr or Thomas*

**265. French Literature of the Early Twentieth Century. (AL, FL)** Emphasis on Gide, Mauriac, Proust, and Colette. One course. *Kaplan*

**266. French Literature of the Mid-Twentieth Century. (AL, FL)** Emphasis on Malraux, Sartre, Camus, and the *nouveau roman*. One course. *Jameson*

**267. Writers, Artists, and Intellectuals in Twentieth-Century France. (AL, FL)** Interdisciplinary focus on one figure or one closely connected group of people (writers, artists, filmmakers, intellectuals, and so on); their works studied in their historical and cultural context. One course. *Moi*

### **Courses Currently Unscheduled**

**14A. Intensive Study of French. (FL)**

**131S. French in the New World. (FL, SS)**

**136S. Life in Eighteenth-Century France. (CZ, FL)**

**151. French Comedy. (AL, FL)**

**157. Difference and Representation. (AL, FL)**

**158. Toward Modernism in French Poetry. (AL, FL)**

**165. French Existentialism. (CZ, FL)**

**166, 167. Contemporary French Life and Thought. (AL, FL)**

**257. Problems of Identity in the Nineteenth-Century Novel. (AL, FL)**

**263. Contemporary French Theater. (AL, FL)**

**281. Paradigms of Modern Thought. (AL)**

**290S. Studies in a Contemporary Figure. (AL, FL)**

### **ITALIAN (IT)**

**1-2. Elementary Italian. (FL)** Understanding, speaking, reading, and writing Italian. Language laboratory available for recording-listening practice. Two courses. *Staff*

**20. Intensive Study of Italian. (FL)** For beginners or intermediate students. Practice in understanding, speaking, reading, and writing. Emphasis on spoken and written language patterns used in everyday life in Italy. Offered through the Intercollegiate Classical Studies Program in Rome. Placement test administered to returning students intending to continue Italian language studies. One course. *Staff*

**21. Accelerated Elementary Italian. (FL)** Basic grammar structures in one semester; emphasis on oral work. Prerequisite: four semesters or the equivalent of another foreign language or consent of instructor. One course. *Staff*

**22. Accelerated Intermediate Italian. (FL)** Readings in modern literature; analysis and discussion. Prepares students to enroll in courses at the 100 level. Prerequisite: Italian 21 or consent of instructor. One course. *Staff*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**63. Intermediate Italian. (FL)** Grammar review, reading, oral practice including laboratory experience. One course. *Staff*

**76. Advanced Intermediate Italian. (FL)** Oral practice, reading, and composition. Prerequisite: Italian 63 or achievement or placement test score of 550-590. One course. *Staff*

**101. Cultural and Literary Perspectives. (AL, FL)** A close reading of cultural and literary texts designed to give students leaving advanced intermediate Italian more polished reading and writing skills. Not open to students who have taken the course as Italian 110. One course. *Finucci or staff*

**102S. Special Topics in Advanced Language. (AL, FL)** Intensive instruction in Italian using newspapers, short stories, and films in order to enhance oral fluency. One course. *Caserta*

**111, 112. Introduction to Italian Literature. (AL, FL)** Major writers of the Italian literary tradition. Selections and complete works of poetry, fiction, theater, and essay. 111: Middle Ages to the seventeenth century. 112: eighteenth, nineteenth, and twentieth centuries. Conducted in Italian. 111 cross-listed with Medieval and Renaissance Studies. Not open to students who have taken the courses as Italian 101, 102. C-L: Medieval and Renaissance Studies. One course each. *Caserta or Finucci*

**113. Italian Short Fiction. (AL, FL)** Novellas and short stories drawn from different periods of Italian literature. Not open to students who have taken the course as Italian 107. One course. *Finucci*

**115. Italian Women Writers. (AL, FL)** Representative works by women. May include only contemporary writers or cover earlier periods as well. Memoirs, works of fiction, poetry, essays, films, and other pertinent texts. Not open to students who have taken the course as Italian 105. C-L: Comparative Area Studies and Women's Studies. One course. *Finucci*

**118S. Italian Literature and Popular Culture. (AL, FL)** The formation of Italian popular culture in different historical periods. Emphasis to vary; attention paid to serial novels, detective fiction, films, prints, paintings, and popular music. May include older forms of popular culture such as the romances of chivalry, the "commedia dell'arte," carnivals, and melodrama. C-L: Comparative Area Studies. One course. *Finucci or staff*

**122. Topics in Italian Literature in Translation. (AL, CZ)** Single authors, genres, movements, or themes. Topics to be announced. One course. *Finucci*

**123. Aspects of Italian Literature. (AL)** Concentration on single authors, periods, genres, regions, or themes. Topics to be announced. (Offered only in the summer program in Florence, Italy.) Taught in English. C-L: Comparative Area Studies and Medieval and Renaissance Studies. One course. *Finucci*

**124. Topics in Italian Literature and Culture. (AL, CZ)** (Taught in English in Italy.) One course. *Staff*

**125. Aspects of Renaissance Culture. (AL, CZ)** Taught in English. See C-L: Medieval and Renaissance Studies 115; also C-L: Art History 149, and History 148. One course. *Finucci, Rasmussen, Rice, Van Miegroet, and Witt*

**131. Topics in Italian Civilization. (CZ, FL)** The institutions and culture of Italy throughout the centuries. Topics to be announced. C-L: Comparative Area Studies. One course. *Finucci or staff*

**139. Modern Italy. (CZ, FL)** Political, social, economic, and cultural problems in Italian history from 1861 to the present. One course. *Caserta*

**141S, 142S. Italian Literature. (AL, FL)** Topics to be announced. Open to juniors and seniors. One course each. *Staff*

**145S. Topics in Renaissance Literature and Culture. (AL, FL)** Topics may include: epic, women writers, treatises, Petrarchism, theater. C-L: Medieval and Renaissance Studies. One course. *Finucci*



**151S. The Italian Theater.** (AL, FL) Introduction to the Italian theatrical tradition. Content varies; six to eight plays from the Renaissance to the present. C-L: Drama 175S. One course. *Finucci*

**155S. Nineteenth-Century Italian Literature.** (AL, FL) An historical and aesthetic appreciation of principal works of selected major Italian writers of the nineteenth century. C-L: Comparative Area Studies. One course. *Caserta*

**159S. Topics in Sexuality and Gender Studies.** (AL, FL) The study of identity and difference and the representation of bodies, genders, and desires in mainstream and popular Italian literature. May include different historical periods. Readings from classical and contemporary works, memoirs, letters, diaries, medical treatises, pamphlets. C-L: Comparative Area Studies, Study of Sexualities, and Women's Studies. One course. *Finucci or staff*

**170S. Film and the Italian Novel.** (AL, FL) Novels and classical narrative cinema. Topics such as novels and their cinematic versions, war, women's fiction and the woman's picture, and neorealism in novel and film. C-L: Comparative Area Studies and Film and Video. One course. *Finucci*

**191, 192. Independent Study.** Directed reading and research. Open only to qualified juniors by consent of instructor and director of undergraduate studies. One course each. *Staff*

**193, 194. Independent Study.** Directed reading and research. Open only to qualified seniors by consent of instructor and director of undergraduate studies. One course each. *Staff*

**283. Italian Novel of the Novecento.** (AL, FL) Representative novelists from Svevo to the most recent writers. C-L: Comparative Area Studies. One course. *Caserta*

**284, 285. Dante.** (AL, FL) 284: *La Vita Nuova* and a close reading of the *Inferno*. 285: the *Purgatorio* and the *Paradiso* in the light of Dante's cultural world. Special attention will be given to the poetic significance of the *Commedia*. Reading in Italian or English. Prerequisite: for 285, Italian 284 or equivalent. C-L: Medieval and Renaissance Studies. One course each. *Caserta*

## PORTUGUESE (PTG)

**1-2. Elementary Portuguese.** (FL) The essential elements of Portuguese structure and vocabulary and aspects of Lusophone culture. Oral comprehension, speaking, reading, and writing. Work in the language learning center required. Two courses. *Damasceno or staff*

**21. Accelerated Elementary Portuguese.** (FL) Basic grammar structures in one semester; emphasis on oral work. Prerequisite: four semesters of another foreign language or consent of instructor. One course. *Damasceno or staff*

**22. Accelerated Intermediate Portuguese.** (FL) Introduction to aspects of Luso-Brazilian culture based on readings, films, and music. Review of basic grammar, emphasis on class reports and participation, several essays required. Prepares students to enroll in courses at the 100 level. Prerequisite: Portuguese 21 or consent of instructor. One course. *Damasceno or staff*

**111S. Research Seminar in Contemporary Lusophone Issues.** (FL) A research seminar that allows students to practice advanced language skills and develop individual research projects on contemporary issues in the Portuguese-speaking world with an interdisciplinary focus. Prerequisite: Portuguese 22 or equivalent. C-L: Comparative Area Studies and Latin American Studies. One course. *Damasceno*

**191, 192, 193, 194. Independent Study.** One course each. *Staff*

**200S. Seminar in Portuguese Literature.** (AL, FL) Topics to be announced. C-L: Comparative Area Studies. One course. *Damasceno*

**202S. Topics in Portuguese and Brazilian Literature and Culture.** (AL, FL) Exploration of topics of cultural formation in the Lusophone world that emphasize autochthonous cultural theory. Examples of semester topics: Brazilian cultural theory: modernism to postmodernism; Brazilian popular culture; Portugal post-Salazar. A graduate level course open to juniors and seniors with background in cultural theory. Level of Portuguese required varies with semester topic; consult instructor. One course. *Damasceno*

## **SPANISH (SP)**

**1-2. Elementary Spanish.** (FL) Understanding, speaking, reading, and writing Spanish. Language laboratory available for recording-listening practice. Two courses. *Staff*

**12. Review of Elementary Spanish.** (FL) Intensive review of first-year Spanish. Open only to students with a placement or achievement score of 430-490. May not be taken for credit by students who have taken 1-2. One course. *Staff*

**14. Intensive Study of Spanish.** (FL) Covers the entire program of elementary Spanish study in one semester using a media-based approach. Primary focus on oral skill development, with additional work on reading and writing. Two courses. *Staff*

**15. Intensive Spanish.** (FL) Covers the entire program of intermediate language study in one semester using a media-based approach. Continued emphasis on oral skill development and the introduction of progressively longer and more challenging reading and writing activities. Prerequisite: Spanish 14 or the equivalent. Two courses. *Staff*

**21. Accelerated Elementary Spanish.** (FL) Basic grammar structures in one semester; emphasis on oral work. Prerequisite: four semesters or the equivalent of another foreign language or consent of instructor. One course. *Staff*

**22. Accelerated Intermediate Spanish.** (FL) Review of basic grammar; emphasis on reading, with some practice in writing. Prepares students to enroll in courses at the 100 level. Prerequisite: Spanish 21 or consent of instructor. One course. *Staff*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**62. Intensive Study of Spanish.** (CZ, FL) Practice in understanding, speaking, and reading; emphasis on spoken language patterns used in everyday life in Costa Rica, with special attention to cultural and environmental topics and issues. Offered only at the Duke/ Organization of Tropical Studies Undergraduate Program in Las Cruces, Costa Rica. Prerequisite: Spanish 1-2, Spanish 12, or equivalent. One course. *Staff*

**63. Intermediate Spanish.** (FL) Grammar review, reading, and oral practice, including laboratory experience. Prerequisite: Spanish 2, 12, or achievement or placement test score of 500-570. One course. *Staff*

**70, 71. Introduction to Literature.** One or two course credits for Advanced Placement in literature. One course each.

**76. Advanced Intermediate Spanish.** (FL) Oral practice, reading, composition. Prerequisite: Spanish 63 or achievement or placement test score of 580-620. One course. *Staff*

**101. Advanced Composition and Conversation.** (FL) The refinement of written and oral expression through the analysis of literary texts. Continued development of vocabulary and the study of grammar in context. One course. *Staff*

**102. Advanced Intensive Spanish. (FL)** Practice in understanding, speaking, reading, and writing Spanish; emphasis on spoken and written language patterns used in everyday life in Costa Rica, with special attention to cultural and environmental topics and issues. Open to advanced students of Spanish. (Taught in Costa Rica.) One course. *Staff*

**104S. Spanish Language: Peninsular or American. (FL)** Topics to be announced. One course. *Staff*

**107. Advanced Grammar. (FL)** A systematic study of modern Spanish morphology and syntax. (Taught in Spain and Bolivia.) Not open to students who have taken Spanish 108S or 109S. One course. *Staff*

**108S. Advanced Colloquial Spanish. (FL)** Colloquial Spanish as a catalyst of popular culture; extensive comparisons of English and Spanish popular sayings and proverbs; emphasis on oral communication. Prerequisite: two Spanish courses at the 100 level. One course. *Garci-Gómez*

**109S. Structure of Spanish. (FL)** A systematic study of modern Spanish morphology and syntax with some readings in current linguistic theory. Prerequisite: Spanish 101. C-L: Linguistics. One course. *Caballero*

**110S. Introduction to Literary Analysis. (AL, FL)** Different genres, including narrative, poetry, drama, essay, film, and song. Texts will be drawn from different periods of Spanish and Spanish-American literature. One course. *Staff*

**111, 112. Introduction to Spanish Literature. (AL, FL)** Major writers of the Spanish literary tradition. Poetry, fiction, theater, and essay. 111: Middle Ages through the seventeenth century. 112: eighteenth, nineteenth, and twentieth centuries. One course each. *Garci-Gómez, Vilarós, or staff*

**114S. Discussion of Readings. (AL, FL)** Selected topics. Open only to freshmen and sophomores. Prerequisite: Spanish 76 or placement/achievement score of 630+. One course. *Staff*

**115, 116. Introduction to Spanish-American Literature. (AL, FL)** A survey of major writers and movements from the period of discovery to the present day. 115: the periods of conquest, colonial rule, and early independence. Includes works by native Indian, *mestizo*, and women writers. 116: from *modernismo* to the contemporary period. C-L: Comparative Area Studies and Latin American Studies. One course each. *Staff*

**117S. Spanish-American Short Fiction. (AL, FL)** Novellas and short stories of the nineteenth and twentieth centuries: Martí, Darío, Quiroga, Borges, Cortázar, García Márquez, Allende, Ferré, Carpentier, and others. Not open to students who have taken Spanish 117A,S. C-L: Latin American Studies. One course. *Pérez-Firmat or staff*

**121. Latin-American Literature in Translation. (AL)** Fictional and poetic works of the last thirty years that have made an impact on world literature. Taught in English. C-L: Comparative Area Studies and Latin American Studies. One course. *Dorfman*

**122S. Topics in Spanish and/or Latin-American Literatures and Cultures. (AL, CZ)** A cultural critique focusing on specific themes to be announced. Topics may include: cultural differences; relations between languages and literatures; national minorities and multiculturalism; postcolonialism; minor literatures; globalization. Taught in English. One course. *Staff*

**124. Special Topics in Latin American Studies. (AL, CZ)** For juniors and seniors. Taught in English. See C-L: Latin American Studies 198; also C-L: Comparative Area Studies. One course. *Staff*

**131. Topics of Hispanic Civilization. (CZ, FL)** A humanistic study of Spain or Spanish America through history, culture, people, and institutions. Topics may vary each semester. C-L: Comparative Area Studies. One course. *Staff*

**132A, S. The Articulation of Culture in the Bolivian Andes. (FL, SS)** Focus on the media and the public sphere, on capitalization and cultural politics, on plurilinguism and multilinguism, and on globalization, ecology, and identities in present-day Bolivia and the Andes. (Taught in Bolivia.) C-L: Cultural Anthropology 199A and Latin American Studies. One course. *Staff*

**132B, S. Colonialism, Ethnicity, and Gender in Postrevolutionary Bolivia. (CZ, FL)** (Taught in Bolivia.) See C-L: Sociology 188B; also C-L: Cultural Anthropology 199E, Latin American Studies, and Women's Studies. One course. *Staff*

**133. Contemporary European Issues. (CZ, FL)** An interdisciplinary seminar addressing topics of European culture, with emphasis on Spain. (Taught in Spain.) C-L: Comparative Area Studies and Cultural Anthropology 182. One course. *Staff*

**137. Topics in Contemporary Spanish Culture. (CZ, FL)** (Taught in Spain.) C-L: Comparative Area Studies. One course. *Garcí-Gómez*

**138S. The Spanish Civil War in History and Literature. (AL, FL)** An examination of the Spanish Civil War of 1936-39 through literary and historical readings, and through its representation in art, music, and film. One course. *Sieburth*

**140A, S. Bolivian Contemporary Short Fiction. (AL, FL)** Introduction to Bolivian and Latin American short fiction. The relationship between contemporary short fiction and the concept of "magical realism." The influence of Borges, Cortázar, García Márquez, Carpentier, as well as the influence of popular folk tale, legend, and myth on contemporary Bolivian fiction writers. (Taught in Bolivia.) C-L: Latin American Studies. One course. *Staff*

**140B, S. Bolivian Literature Since the Reemergence of Democracy (1982-1995). (AL, FL)** The Bolivian literary production after the long period of authoritarian regimes (1964-1982). How narrators and poets have responded aesthetically to the social and political changes. (Taught in Bolivia.) C-L: Latin American Studies. One course. *Staff*

**140C, S. Cultural Diversity in the Andes. (CZ, FL)** Social, political, and cultural issues of the indigenous Aymara population in present-day Bolivia. Focus on the educated Aymara elite and their struggle to attain recognition in a multicultural society deeply divided along racial and ethnic lines. (Taught in Bolivia.) C-L: Comparative Area Studies, Cultural Anthropology 140S, and Latin American Studies. One course. *Staff*

**140E. Film and Political Culture in Contemporary Bolivia. (AL, FL)** Focus on films and mass media used to appeal to the dispossessed and marginal sectors of society. (Taught in Bolivia.) C-L: Latin American Studies. One course. *Staff*

**142S. Spanish Literature. (AL, FL)** Topics to be announced. Open to juniors and seniors. One course. *Staff*

**143S. Literature of the Discovery and Conquest of America. (AL, FL)** Prose and poetry from the sixteenth through eighteenth centuries, exploring the idea of the New World from conquest to independence. C-L: Comparative Area Studies and Latin American Studies. One course. *Staff*

**144S. Spanish-American Literature of Identity. (AL, FL)** Exploration of the concepts of *lo criollo* or *lo americano*, essentially through the analysis of texts by Arriví, Carpentier, Neruda, Paz, and others. C-L: Comparative Area Studies and Latin American Studies. One course. *Pérez-Firmat*



**145S. Literature of the Hispanic Minorities of the United States.** (AL, FL) Representative Spanish-language works by Puerto Rican, Cuban-American and Chicano writers. C-L: Comparative Area Studies and Latin American Studies. One course. *Pérez-Firmat*

**146. The Spanish-American Novel.** (AL, FL) Masterworks of the twentieth century. C-L: Comparative Area Studies and Latin American Studies. One course. *Moreiras or staff*

**147S. Latin-American Women Writers.** (AL, FL) Exploration of common themes across the region, such as family, love, feminism, and violence. May include only contemporary writers or cover authors from earlier periods as well. May study Brazilian writers in Spanish or in English translation. May concentrate on narrative or include poetry and drama. Open only to juniors and seniors. C-L: Comparative Area Studies, Latin American Studies, and Women's Studies. One course. *Staff*

**148. Colonial and Postcolonial Studies in Latin America and the Caribbean.** (CZ, FL) Focus on Western colonial expansion since the sixteenth century and on the national periods, following the movement of independence. Cultural differences of colonial and postcolonial experiences; transition from colonial to postcolonial regimes. Languages and literatures, history of ideas, cartography, and the social imaginary expressed in everyday life, from architecture to clothing, from rules of social behavior to ecological consciousness. Limited to juniors and seniors. C-L: Latin American Studies and Perspectives on Marxism and Society. One course. *Mignolo*

**151. Spanish Literature of the Renaissance and the Baroque.** (AL, FL) Selected works of the sixteenth and seventeenth centuries with attention to their reflection of social, religious, and political ideas. C-L: Medieval and Renaissance Studies. One course. *Greer*

**153. Golden Age Literature: Cervantes.** (AL, FL) Emphasis on the *Quijote*. C-L: Medieval and Renaissance Studies. One course. *Greer*

**161S. Literature and the Performing Arts I.** (AL, FL) Selected literary works written before the nineteenth century that have been rendered in film or are presently on stage in Madrid. Students will see the films or plays. (Taught in Spain.) One course. *Staff*

**162S. Literature and the Performing Arts II.** (AL, FL) Selected literary works of the nineteenth and twentieth centuries that have been rendered in film or are presently on stage in Madrid. Students will see the films or plays. (Taught in Spain.) One course. *Staff*

**165S. Major Spanish Authors.** (AL, FL) Textual studies; methods of literary interpretation and criticism. One course. *Vilarós or staff*

**169. Topics in Nineteenth- and Twentieth-Century Spanish Literature.** (AL, FL) Focus on a specific genre or theme to be announced. One course. *Sieburth or Vilarós*

**171. Literature of Contemporary Spain.** (AL, FL) A cultural critique of contemporary Spain (1936 to present) through different literary genres (novel, theater, poetry). Authors include Celaya, Otero, Arrabal, Rodoreda, Goytisolo, and Martín-Gaité. C-L: Comparative Area Studies and Perspectives on Marxism and Society. One course. *Vilarós or staff*

**175S. Hispanic Literature and Popular Culture.** (AL, FL) Works of Spanish and Latin American fiction that parody or rewrite popular culture genres such as serial novels, detective stories, or Hollywood films. Authors include Cervantes, Galdós, Borges, Marsé, and Puig. C-L: Comparative Area Studies and Latin American Studies. One course. *Sieburth*

**176S. Disenchanted Texts: Spanish Literature 1975-1990.** (AL, FL) Study of some of the literary works written in Spain between 1975 (year of Franco's death) and 1990, a period of political transition and social disenchantment. How this specific disenchantment is present

in literary texts as an expression of an unconscious and repressed mourning for the dictator as a father figure, as a nostalgia for a conflictive past, and as a confrontation with an uncertain present and future. Postdictatorship works of authors born in the 1920s and 1930s read alongside literary productions of the generation born after 1950. Authors include Goytisolo, Gil de Biedma, Vázquez Montalbán, Espinosa, Montero, Jaén, Ortiz, and others. One course. *Vilarós*

**177S. Women Writers of Spain.** (AL, FL) Prominent Spanish women writers through literary history, from María de Zayas and Santa Teresa de Avila (XVI Century) to Carmen Martín Gaité or Almudena Grandes (contemporary). Fictional writing, films, essays, and other pertinent texts. Catalan and Galician authors, such as Mercè Rodoreda or Rosalía de Castro (as well as Basque authors when translations are available); Castilian-Spanish writers. Questions of gender identity will be particularly important for this course. C-L: Women's Studies. One course. *Vilarós or staff*

**191, 192. Independent Study.** Directed reading and research. Open only to qualified juniors by consent of instructor and director of undergraduate studies. One course each. *Staff*

**193, 194. Independent Study.** Directed reading and research. Open only to qualified seniors by consent of instructor and director of undergraduate studies. One course each. *Staff*

**195. Topics in Spanish Literature and Culture.** (AL, FL) Topics to be announced. Offered only in the Duke in Madrid Program. One course. *Staff*

**200S. Seminar in Spanish Literature.** (AL, FL) Topics to be announced. One course. *Staff*

**210. History of the Spanish Language.** (FL) Formation and development. Internal forces and external contributions. C-L: Comparative Area Studies, Linguistics, and Medieval and Renaissance Studies. One course. *Garcí-Gómez*

**244. Topics in Twentieth-Century Latin-American Fiction.** (AL, FL) Study of various critical problems in the narrative of the area. Focus on one or more major issues, such as the representation of violence, magical realism, *indigenismo*, *novela de la tierra*. Prerequisite: Spanish 106. One course. *Moreiras*

**245. Latin-American Poetry.** (AL, FL) Focus on major movements and authors. Non-mainstream poetical traditions, such as poetry written in Quechua, oral poetry. Prerequisite: Spanish 106. C-L: Comparative Area Studies and Latin American Studies. One course. *Moreiras or staff*

**246. Textual Politics in Nineteenth-Century Spanish-American Literature.** (AL, FL) The political uses of writing by different social actors. Topics may include ethnic and sexual identities, popular and educated traditions, scientific fictions, modernization, and the role of the writer. C-L: Latin American Studies. One course. *Nouzeilles*

**248. Studies in Spanish-American Literature.** (AL, FL) Concentration on single authors, genres, movements, or themes. One course. *Staff*

**250. Latin-American Film.** (AL, FL) Study of Latin-American film through selected films and critical texts. Attention paid to contemporary production given availability, such as the work of Raúl Ruiz, Miguel Littin, Eliseo Subiela. C-L: Latin American Studies. One course. *Moreiras and staff*

**251S. Spanish Film.** (AL, FL) Cultural critique of Spanish film history. Topics range from the study of the production of a Spanish national identity within a changing global context to the study of a particular movement (for example, Nuevo cine de mujeres), period (for

example, Civil War), or author (for example, Luis Buñuel or Pedro Almodóvar), to a critical survey of Spanish film from the 1920s to the present. C-L: Perspectives on Marxism and Society. One course. *Vilarós*

### Courses Currently Unscheduled

- 163. The Generation of 1898. (AL, FL)
- 166. Nineteenth-Century Prose Fiction. (AL, FL)
- 262. The Romantic Movement. (AL, FL)
- 275. Modern Spanish Poetry. (AL, FL)
- 276. Modern Spanish Drama. (AL, FL)
- 277. Modern Spanish Novel. (AL, FL)

### ROMANCE STUDIES (RS)

124. **Modernity, Ethnicity, and Colonization.** (AL, CZ) Cultural issues related to Spanish, Portuguese, and French colonial expansion in the New World. Topics such as languages and ethnicity; cultural literacy in colonial and multilingual situations; education and the state; civilization and modernity; postcoloniality and postmodernity. Taught in English; readings in Spanish and/or Portuguese and/or French, according to the particular topic of the semester. C-L: African and African-American Studies 123, Canadian Studies, Comparative Area Studies, and Cultural Anthropology 130. One course. *Mignolo or staff*

125. **Introduction to North America.** (CZ, SS) See C-L: North American Studies 110; also C-L: Cultural Anthropology 129, Economics 115, History 108F, Latin American Studies, Political Science 119, Public Policy Studies 115, and Sociology 109. One course. *Thompson*

210S. **Topics in Linguistics.** (SS) One course. *Staff*

283S. **Seminar in North American Studies.** (CZ) See C-L: North American Studies 283S; also C-L: Cultural Anthropology 283S, History 283S, Political Science 285S, Public Policy Studies 282S, and Sociology 283S. One course. *Staff*

### Courses Currently Unscheduled

218. The Teaching of Romance Languages.

### INDIGENOUS LANGUAGES

#### Aymara (AYM)

21. **Beginning Aymara.** (FL) Introduction through immersion to the history and structure of Aymara. (Taught in the Duke in the Andes Program only.) One course. *Staff*

63. **Intermediate Aymara.** (FL) Grammar review, reading, and oral practice. Review of the history of Aymara/Spanish contact. (Taught in the Duke in the Andes Program only.) One course. *Staff*

76. **Advanced Aymara.** (FL) Oral practice, writing exercises, and advanced grammar. Further studies of Aymara/Spanish contact in the current Bolivia and the Andes. (Taught in the Duke in the Andes Program.) One course. *Staff*

#### Quechua (QCH)

21. **Beginning Quechua.** (FL) Introduction through immersion to the history and structure of Quechua. (Taught in the Duke in the Andes Program only.) One course. *Staff*

63. **Intermediate Quechua.** (FL) Grammar review, reading, and oral practice. Review of the history of Quechua/Spanish contact. (Taught in the Duke in the Andes Program only.) One course. *Staff*



76. **Advanced Quechua.** (FL) Oral practice, writing exercises, and advanced grammar. Further studies of Quechua/Spanish contact in the current Bolivia and the Andes. (Taught in the Duke in the Andes Program.) One course. *Staff*

## THE MAJOR

Majors are offered in French Studies, Italian and European Studies, and Spanish. The French Studies and Spanish majors offer several different tracks, as described below.

*Prerequisite.* French, Italian, or Spanish 22, 76, or equivalents.

**French Studies Major Requirements.** The French Studies major offers two tracks: (1) French Studies and (2) French and European Studies.

*Prerequisites:* French 100 or equivalent (grade of A- or above in French 22 or 76, Advanced Placement literature score of 5, achievement test score of 620, or placement test score of 600 or above, or comparable linguistic experience).

(1) *French Studies:* A total of ten courses at the 100 level and above, eight of which must be from departmental offerings taught in French. These eight core courses must include two survey courses (either 101 or 105, and either 102 or 106), and at least three courses at the 140 level or above. The two remaining courses must be on French-related topics and may be taken either in the department or in other departments (consult the undergraduate major advisor concerning approved related courses).

(2) *French and European Studies:* An interdisciplinary track requiring a total of ten courses at the 100 level or above, seven of which must be from departmental offerings taught in French. Of these seven core courses at least three must be at the 140 level or above. Three courses on any European-related topic at the 100 level or above must be taken in other departments. Proficiency in another European language is highly desirable (consult the undergraduate major advisor concerning approved related courses).

**Italian and European Studies Major Requirements:** An interdisciplinary track requiring a total of ten courses at the 100 level or above. Five Italian courses must be taken, at least two of which must be at the 140 level or above. Five courses on any Europe-related topic at or above the 100 level must be taken in other departments (consult the undergraduate major advisor concerning approved related courses).

**Spanish Major Requirements.** The Spanish major offers three tracks: (1) Spanish Studies, (2) Spanish and Latin American Studies, and (3) Spanish and European Studies.

(1) *Spanish Studies:* A total of ten courses at the 100 level and above, eight of which must be from departmental offerings taught in Spanish. These eight core courses must include any two of the survey sequences (111, 112, 115, 116) and at least three courses at the 140 level or above. The two remaining courses must be on Peninsular or Latin America-related topics and may be taken either in the department or in other departments (consult the undergraduate major advisor concerning approved related courses).

(2) *Spanish and Latin American Studies:* An interdisciplinary track requiring a total of ten courses at the 100 level and above, seven of which must be from departmental offerings taught in Spanish. These seven core courses must include one survey course on Latin American literature (115 or 116), and at least three courses at the 140 level or above, two of which must be on Latin American topics. Three courses on Latin American topics at or above the 100 level must be taken in other departments. A Brazilian literature course at or above the 100 level offered by the department may be substituted for one of these three courses. Proficiency in Portuguese is highly desirable (consult the undergraduate major advisor concerning approved related courses).

(3) *Spanish and European Studies:* An interdisciplinary track requiring a total of ten courses, seven of which must be from departmental offerings taught in Spanish. These seven core courses must include one survey course on Peninsular topics (111 or 112) and at least three courses at the 140 level or above, two of which must be on Peninsular topics. Three courses on an European-related topic at or above the 100 level must be taken in other departments. Proficiency in another European language is highly desirable (consult the undergraduate major advisor concerning approved related courses).



Courses numbered 120 through 129 are taught in English and do not count toward the major (French and Spanish only). Course numbers 181 and 182 (now renumbered as 21, 22) do not count toward the major (French, Spanish, and Italian).

*Study Abroad.* Students are strongly urged to study abroad since this is the best way to achieve language proficiency and to acquire knowledge of a country's culture. The department in conjunction with the Office of Foreign Academic Programs sponsors the following study abroad programs: Duke-in-Madrid, Duke-in-the-Andes (semester programs); Duke-in-France (one-year program); and Duke-in-France and Duke-in-Spain (summer programs). A maximum of two courses per semester, or one per summer, may be counted toward the seven or eight core courses required in any of the major tracks. (The summer course restriction does not apply to Duke-administered programs.)

*Graduation with Distinction.* The department encourages French, Italian, and Spanish majors to work towards the completion of a thesis for the honor of Graduation with Distinction. The student's overall and major grade point average must be at least 3.3 at the time of application. These averages must be sustained until graduation. The student must satisfy the requirements of the major program as they are stated in the previous section on the major in this bulletin.

If the student meets the requirements listed above, the student will make application through independent study no later than the preregistration period for the fall semester of his/her senior year. The student will be expected to approach the instructor whom he/she wishes to have as his/her supervising professor. The principal piece of evidence that the student will offer in support of his/her candidacy for Graduation with Distinction will be the completed thesis done through the independent study course(s) that it is expected will normally be completed during the senior year, or during the junior and senior years. The thesis should be approximately forty pages in length, typewritten, and conforming in style to the specifications of the MLA Style Sheet. The thesis will normally be written in the student's major foreign language.

The student will defend the thesis (in the student's major foreign language) before the Committee on Graduation with Distinction no later than the last day of the final examination period. (The committee will consist of three persons: the supervising professor and two other faculty members.) If the committee finds that the thesis and defense merit consideration for Graduation with Distinction, the student will be awarded one of the following levels of distinction: Highest Distinction, High Distinction or Distinction.

Students interested in pursuing the Graduation with Distinction program should obtain more detailed information and an application from 104 Languages Building.

*Suggested Work in Related Disciplines.* In order to give perspective to a student's program, majors in French or Spanish will normally select, with the approval of the major advisor, appropriate courses from such fields as: (1) other languages and literatures; (2) history and cultural anthropology; (3) philosophy; (4) music and art and (5) linguistics.

## THE MINOR

Minors are offered in French Studies, Italian Studies, and Spanish.

### French Studies

*Requirements.* A total of five courses from departmental French offerings numbered 100 or above and taught in French. These must include one survey course (101, 102, 105, or 106) and at least two courses numbered at the 140 level or above.

### Italian Studies

*Requirements.* A total of five courses from departmental Italian offerings numbered 100 or above. These must include at least one course numbered at the 140 level or above. Four (4) of the five (5) courses must be taught in Italian.

## Spanish

*Requirements.* A total of five courses from departmental Spanish offerings numbered 100 or above. These must include one survey course (111, 112, 115, or 116) and at least two courses at the 140 level or above. All five courses must be taught in Spanish.

## Russian

For courses in Russian, see Slavic Languages and Literatures.

## Science, Technology, and Human Values Program (STH)

Professor Vesilind, *Director*

A certificate, but not a major, is available in this program.

The Program in Science, Technology, and Human Values offers students an opportunity to cross departmental and professional lines in enriching their educational experience. The program offers monthly dinner/seminars for students and faculty, sponsors three courses designed to bridge the "two cultures," and provides an organized approach to selecting courses that offer interdisciplinary approaches to the study of values in our increasingly technological society.

### COURSE OF STUDY

The seven courses which satisfy the requirements of this program are classified according to their approach: ethical, analytical (historical, philosophical, or sociological), policy-centered. Each of these three approaches is, in turn, applied to three different areas of study: Science, Medicine, Technology. The nine related-approaches-areas of study form a matrix of courses. Trinity College undergraduates must take six courses in four of the nine categories including one course applying each of the three approaches. They must also complete the senior capstone course (Science, Technology and Human Values 108S). Science, Technology, and Human Values 112 and 113 are "wildcards"; they cover all categories and thus satisfy any one or two, if both are taken, of the four needed categories. No more than three courses which originate in the same department or program other than those originating in Science, Technology and Human Values may be taken by Trinity College undergraduates who must take at least four courses at the 100-level.

Science majors are urged to take at least one course that treats each of the three approaches in relation to the science area; pre-medical students should follow the same path with respect to the medicine area and engineers should follow the same path with respect to the technology area.

Undergraduates in the School of Engineering must complete four courses from the nine categories, as well as Science, Technology and Human Values 108S. Such students are also exempt from other course restrictions as listed above.

**108S. Professional Ethics. (SS)** Case study approach used to introduce professional ethics. Topics include moral development, confidentiality, risk and safety, social responsibility, fraud and malpractice, legal aspects of professionalism, and environmental ethics. The capstone course for students completing the certificate in the Program in Science, Technology, and Human Values. C-L: Engineering 108S. One course. *Vesilind*

**112S, 113S. Special Topics in Science, Technology, and Human Values.** Six four-week segments offered sequentially over the fall and spring semesters by faculty of the Program in Science, Technology, and Human Values. Credit for 112S or 113S is awarded for completion of three to five segments within a single academic year; credit for 112S and 113S for completion of six segments. Only students who take three segments in the fall semester

should register for 112S; those who take no more than two segments in the fall and one or more segments in the spring semester should register instead for 113S in the spring. One course each. *Vesilind and staff*

## ELIGIBILITY AND CERTIFICATION

Undergraduates may apply to the program at any time. To students who complete the program, Duke University gives official recognition of their participation. Further information about the program, the approved courses, and the matrix may be obtained at: 203 Hudson Hall; <http://www.duke.edu/sthv>; e-mail: [pav@egr.duke.edu](mailto:pav@egr.duke.edu)

## Study of Sexualities (SXL)

Professor Younger, *Director*

A certificate, but not a major, is available in this program.

The Program in the Study of Sexualities offers an interdisciplinary course of study that introduces students to critical analyses of the various expressions of sexuality in societies around the world, both past and present. Such expressions encompass a wide range from heterosexuality to homosexuality, and include other erotic desires, sexual relationships, and gender roles. Critical analyses concern how sexuality is formed, defined, and regulated by biological and social forces.

Students must take as an introductory course Study of Sexualities 115D, Cultural Anthropology 103 or Sociology 149, and five additional courses, one of which may be a special seminar designed mainly for program participants. Of the total six courses, no more than three taken can originate in a single department, and four must be at or above the 100-level. Appropriate courses may come from the list given below and may include other courses (new courses, special topics courses, and independent study) as approved by the director. Regular courses are described under the listings of the various departments. Students may also wish to take advantage of house courses offered on topics in this area although house courses cannot satisfy the requirements of the program.

## STUDY OF SEXUALITIES COURSE

**115D. Perspectives in Gay, Lesbian, and Bisexual Studies. (CZ)** Topics include homosexuality and history, religion, law, education, the arts and literature, the military, and the health sciences. C-L: English 101D. One course. *Younger*

## OTHER COURSES

### African and African-American Studies

209S. Race, Class, and Gender in Modern British History. (Cross-listed.) *Thorne*

216S. Gender, Race, and Class. (Cross-listed.) *Luttrell*

### Biological Anthropology and Anatomy

146. Sociobiology. *van Schaik*

### Cultural Anthropology

103. Sexuality and Culture in America. (Cross-listed.) *Luttrell*

113. Gender and Culture. (Cross-listed.) *Allison, Luttrell, Quinn, or Silverblatt*

142. Sexuality in Global Perspective. (Cross-listed.) *Luttrell*

216S. Gender, Race, and Class. (Cross-listed.) *Luttrell*

### English

101D, D. Perspectives in Gay, Lesbian, and Bisexual Studies. (Cross-listed.) *Younger*

184. Literature and Sexualities. *Clum, Goldberg, or Moon*

## History

- 169A. American Women, 1600-1877. (Cross-listed.) *Hewitt*  
169B. American Women, 1877 to the Present. (Cross-listed.) *Hewitt*  
209S. Race, Class, and Gender in Modern British History. (Cross-listed.) *Thorne*

## Italian

- 159S. Topics in Sexuality and Gender Studies. (Cross-listed.) *Finucci or staff*

## Psychology

- 177S. Human Sexuality (B). *Staff*  
264S. Gender, Hormones, and Health (P). (Cross-listed.) *Hamilton*

## Public Policy Studies

108. AIDS: Ethics, Policy, and Representation. (Cross-listed.) *Rudy*

## Religion

125. Women and Sexuality in the Christian Tradition. (Cross-listed.) *Clark*  
138. Women and Religion in America. (Cross-listed.) *Joyce*  
182. Medicine and Religion in American Society. *Joyce*  
262. Special Topics in Gender and Religion. (Cross-listed.) *Joyce*

## Sociology

103. Sexuality and Culture in America. (Cross-listed.) *Luttrell*  
118. Sex, Gender, and Society. (Cross-listed.) *Buchmann or O'Rand*  
149. Sexuality and Society. (Cross-listed.) *Bach or Tiryakian*

## Women's Studies

108. AIDS: Ethics, Policy, and Representation. (Cross-listed.) *Rudy*

## SPECIAL TOPIC COURSES OFFERED PERIODICALLY

### Cultural Anthropology

112. Gender and Languages. *Andrews*  
280S. Gender and Learning and Teaching. *Luttrell*

### Classical Studies

- 195S.01. Gender and Sexuality in Ancient Greece. *Younger*  
195S.01. Gender and Sexuality in Ancient Rome. *Janan*

### English

288. Gay Abandon. *Moon*  
288. Homosexuality-Masculinity in Drama. *Clum*

## History

103. Cultural Perspectives of the Twentieth-Century, United States South. *Howard*

## Literature

152. Love, Marriage, and Adultery in the Nineteenth Century. *Moi*  
289. Sex and Gender. *Moi*

## Psychology

- 180S. Advanced Topics in the Psychology of Gender. *Fischer, Hamilton, or Roth*

## Religion

- 72C. Defining Deviance. *Joyce*  
262. Special Topics in Gender and Religion. *Joyce*

## Slavic Languages and Literatures

Research Scholar Mickiewicz, *Acting Chair*; Professor Andrews, *Director of Undergraduate Studies*; Associate Professor Lahusen; Assistant Professor Gheith; Associate Professor Emeritus Jezierski; Associate Professor of the Practice Flath; Assistant Professors of the Practice Maksimova and Van Tuyl

A major or minor is available in this department.

The Department of Slavic Languages and Literatures has a strong commitment to increasing the language proficiency of its students in the context of culture acquisition, to helping students develop their own scholarly interests and research abilities, and to



acquainting students with trends in literary and linguistic theory. Areas of specialization include nineteenth and twentieth century Russian and Soviet literature, gender studies, film and media, legal and business Russian language, translation, Slavic linguistics, contemporary Russian literature, scientific and scholarly Russian language, stylistics, and history of the Russian literary language. Other Slavic languages occasionally taught include Polish, Ukrainian, Serbian and Croatian.

Resources for study include a state-of-the-art language laboratory with video facilities and a humanities computing facility, reception of daily Russian television programming, and an exchange program with St. Petersburg University. The department offers both semester-long and summer language and culture programs at St. Petersburg University. The department also hosts a Russia-based FOCUS seminar and maintains a cooperative relationship with the Duke Program in Literature, Women's Studies, Cultural Anthropology, and the Center for Slavic, Eurasian and East European Studies, as well as with related programs at the University of North Carolina at Chapel Hill.

## **RUSSIAN (RUS)**

**1-2. Elementary Russian. (FL)** Introduction to understanding, speaking, reading, and writing. Audiolingual techniques are combined with required recording-listening practice in the language laboratory. Two courses. *Van Tuyl*

**4, 5. Elementary Russian Conversation. (FL)** Introduction to spoken Russian with emphasis on basic conversational style and increasing vocabulary. Half course each. *Staff*

**14. Intensive Russian. (FL)** Russian 1 and 2 combined in one semester. Two meetings daily, as well as daily computer and language laboratory work. Two courses. *Andrews or Maksimova*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**61S, 62S. Intermediate Russian Language and Culture. (CZ, FL)** Intensive classroom practice in phonetics, conversation, and grammar. Literature, films, museums, and theater performances. (Taught in St. Petersburg in Russian and English depending on placement.) Prerequisite: Russian 2 or equivalent. One course each. *Staff*

**63. Intermediate Russian I. (FL)** Intensive classroom and laboratory practice in spoken and written patterns. Reading in contemporary literature. Prerequisites: Russian 1 and 2, or two years of high school Russian. One course. *Flath*

**64. Intermediate Russian II. (FL)** Intensive classroom and laboratory practice in spoken and written patterns. Reading in contemporary literature. Prerequisites: Russian 1, 2 and 63 or equivalent. One course. *Flath*

**66, 67. Intermediate Russian Conversation. (FL)** Consolidation of oral skills. Intensive conversation on a broad range of topics. Prerequisites: Russian 1 and 2, or equivalent. Half course each. *Staff*

**70. Intensive Intermediate Russian. (FL)** Russian 63 and 64 combined. Two meetings daily, as well as daily computer and language laboratory work. Two courses. *Staff*

**101S, 102S. Contemporary Russian Composition and Readings. (FL)** Advanced grammar and syntax with intense composition component. Analytical readings in the original. Prerequisites: for 101S, Russian 63 and 64, or equivalent; for 102S, Russian 101S. One course each. *Staff*

**103S, 104S. Studies in the Russian Language and Culture. (CZ, FL)** Analytical readings including grammatical and textual analysis. Additional work in phonetics and conversation. Literature, films, museums, and theater performances. (Taught in St. Petersburg in Russian.) Prerequisite: Russian 64 or equivalent. C-L: Comparative Area Studies. One course each. *Staff*

**105, 106. Third-Year Russian Conversation. (FL)** Conversation course for students enrolled in Russian 101, 102. Not open to students currently taking Russian 63, 64 or Russian 195, 196. Half course each. *Staff*

**107S. Russian Phonetics. (FL)** Analysis of contemporary standard Russian literary pronunciation, phonology, and intonational structures. Prerequisite: Russian 64 or consent of instructor. One course. *Staff*

**108S. Soviet Civilization: History and Its Mythologies. (AL, CZ)** The most significant concepts, events, and personages of Russian and Soviet history through the prism of Soviet and post-Soviet official and popular culture, literatures, the arts, and cinema. Topics include: proletarian dictatorship and woman's liberation, the "Russian Idea" and the "struggle for peace," the October Revolution, and industrialization, Russian Czars, post-Soviet leaders from Ivan the Terrible and Peter the Great to Lenin, Stalin, and Gorbachev. Taught in English. One course. *Staff*

**110. Intensive Russian Composition and Readings. (AL, FL)** Russian 101S and 102S combined in one course. Two meetings daily, as well as daily language laboratory work. Two courses. *Staff*

**111S, 112S. Senior Honors Seminar.** Introduction to methods of research and writing, including selection of thesis topics, preliminary research and organization, and writing of the thesis. Consent of the director of undergraduate studies required. One course each. *Staff*

**113. Studies in Comparative World Cinema. (AL)** See C-L: Literature 113; also C-L: English 122, Film and Video, and German 113. One course. *Staff*

**115. Russian Language Studies in St. Petersburg. (FL)** Russian grammar and composition taught only in St. Petersburg for students participating in the semester program. One course. *Staff*

**119S, 120S. Topics in Slavic and Northern European Languages. (FL, SS)** Introduction to a Slavic or Northern European language, including relevant linguistic topics and theories. Open only to students in the FOCUS Program. One course each. *Andrews*

**121S, 122S. Introduction to Russian Literature. (AL, FL)** Major works in Russian literature including prose and poetry. Prerequisite: Russian 63, 64 or equivalent. One course each. *Staff*

**130. Soviet Cinema. (AL)** History of Soviet film industry from silent to sound period. Overview of major theorist-filmmakers: Eisenstein, Pudovkin, Vertov. Issues of reception, audience, politics, form, national and ethnic identities. Taught in English. C-L: Comparative Area Studies, Film and Video, and Perspectives on Marxism and Society. One course. *Gaines, Jameson, and Lahusen*

**131. Language, Culture, and Myth: The Slavic Proverb. (AL)** The sources of the Slavic proverb, the proverb as microtext of national stereotypes, and its function in modern literature and culture. Problems of translation. Taught in English. C-L: Comparative Area Studies. One course. *Staff*

**135. Contemporary Russian Media. (FL, SS)** Analytical readings and study of change and development in all the primary forms of mass media in the former Soviet Union from 1985 to present (newspapers, journals, and television). Topics include censorship, TASS, samizdat. Taught in English, readings in Russian. Prerequisite: Russian 64 or equivalent. C-L: Comparative Area Studies and Film and Video. One course. *Andrews*

**135A. Contemporary Russian Media. (FL, SS)** Same as Russian 135 but taught only in St. Petersburg. Prerequisite: Russian 64 or equivalent. C-L: Comparative Area Studies and Film and Video. One course. *Staff*

**149S. Russian Culture in the Era of Terror: A Reexamination.** (AL) Readings from various sources, such as recently published diaries and literary works; film; critical and historical material. The "era of the great terror" (1934-39): seen through cultural production, its reception through everyday life narratives and contemporary ideology critique. Taught in English. Also taught as History 195S. C-L: Comparative Area Studies and Perspectives on Marxism and Society. One course. *Lahusen*

**155. Special Topics in Russian and American Culture.** (AL) Addresses the broad, interdisciplinary issue of identity and otherness while studying specifically what happens when the cultures of Russia and the United States come into contact. Taught in English. C-L: Comparative Area Studies. One course. *Lahusen and Van Tuyl*

**157S. Law, Culture, and the Russian Legal Tradition.** (CZ, SS) A study of the development of the Russian legal tradition, with particular emphasis on the historical and cultural factors that have contributed to its emergence, comparing the Russian tradition with the Western legal tradition. How law, lawyers, and legal institutions have been portrayed in Russian popular culture, especially Russian literature. Taught in English. Open only to students in the FOCUS Program. C-L: Public Policy Studies 131S. One course. *Newcity*

**159. Women's Autobiographies in European Contexts: Telling the Self in Russia, France, and Britain.** (AL) A comparative approach to women's autobiography (in England, France, and Russia) in the nineteenth and twentieth centuries, using texts from approximately the same time periods. C-L: Comparative Area Studies and Women's Studies. One course. *Gheith*

**160. The Classics of Russian Twentieth-Century Literature.** (AL, CZ) Prose works that marked the canon and anticanon of twentieth-century Russia. Readings include: *Petersburg* (A. Bely), *Mother* (M. Gorky), *Envy* (Yu. Olesha), *How the Steel Was Tempered* (N. Ostrovsky), *The Master and Margarita* (M. Bulgakov), *Doctor Zhivago* (B. Pasternak), *One Day in the Life of Ivan Denisovich* (A. Solzhenitsyn), and *The Long Goodbye* (Yu. Trifonov). Taught in English. C-L: Comparative Area Studies. One course. *Lahusen*

**161. Masterpieces of Nineteenth-Century Russian Literature I.** (AL) Selected nineteenth-century authors, works, and genres. Authors include Pushkin, Lermontov, Gogol, Turgenev, Herzen, Goncharov, and Dostoevsky. Taught in English. C-L: Comparative Area Studies. One course. *Staff*

**162. Masterpieces of Nineteenth-Century Russian Literature II.** (AL) Selected authors, works, and genres from the second half of the nineteenth century. Authors include Turgenev, Chernyshevsky, Dostoevsky, Tolstoy, Saltykov-Shchedrin, and Chekhov. Taught in English. C-L: Comparative Area Studies. One course. *Staff*

**163. Literature of Former Soviet Republics.** (AL) Ukrainian realism of the nineteenth century, futurism, neoclassicism, and the literary struggle of the 1920s; Belorussian literature; Lithuanian psychological prose; the Estonian experimental novel; Georgian literature from Rustaveli to the philosophical novel of the 1970s; the work of Chingiz Aitmatov; Soviet "recent literacy." Taught in English. C-L: Comparative Area Studies. One course. *Staff*

**164. Symbolist Movement in Russia.** (AL) History and theory of the philosophy, poetry, prose, and criticism of the Russian variant of the interdisciplinary and international movement. The momentous movement spawning a variety of other creative schools that constitute twentieth-century Russian modernism. Taught in English. One course. *Mickiewicz*

**168S. Russian Classical Literature and Music.** (AL) The interaction of literary and musical texts. Includes literary texts by Pushkin, Lermontov, Gogol, Leskov and musical texts (operas) by Tchaikovsky, Borodin, Glinka, Moussorgsky, Rimsky-Korsakov, Rubinstein, and Shostakovich. Taught in English. C-L: Comparative Area Studies. One course. *Staff*



**170. Russian Dissident and Emigré Literature. (AL)** The literature of opposition in Russia during the nineteenth and twentieth centuries, from Chaadaev and Chernyshevsky to Grossman, Solzhenitsyn, and Zinoviev. Taught in English or Russian. C-L: Comparative Area Studies. One course. *Lahusen*

**172S. Pushkin and His Time. (AL)** Pushkin and the literary revolution around 1830. Prose works (*The Tales of Belkin*, *The Queen of Spades*, *The Captain's Daughter*) and major lyrical poetry. Taught in English. C-L: Comparative Area Studies. One course. *Gheith or Van Tuyl*

**174. Gender and Language. (SS)** Theoretical approaches to the question of the interrelationship of gender and language including neurobiology, psychology, semiotics, feminist critical theory, philosophy of language, discourse analysis, and linguistic theory. Taught in English. C-L: Cultural Anthropology 174, English 115, Linguistics, and Women's Studies. One course. *Andrews*

**175. Tolstoy. (AL)** Introduction to life, works, and criticism. Readings include: *War and Peace*, *Anna Karenina*, the shorter fiction, dramatic works and essays. Taught in English. C-L: Comparative Area Studies. One course. *Van Tuyl*

**176. Dostoevsky. (AL)** Introduction to life, works, and criticism. Readings include: *Crime and Punishment*, *The Idiot*, and *The Brothers Karamazov*. Taught in English. C-L: Comparative Area Studies. One course. *Flath, Gheith, or Van Tuyl*

**177S. Chekhov. (AL)** Drama and prose works. Taught in English. Not open to students who have taken Drama 157S/Russian 174S (Chekhov). C-L: Comparative Area Studies and Drama 177S. One course. *Flath and staff*

**178A. Russian Short Fiction. (AL)** The history, development, and shifts of Russian short fiction in the nineteenth and twentieth centuries. Authors include Dostoevsky, Vovchok, Leskov, Chekhov, Gippius, and Zoshchenko. Topics include gender, genre, and national identity in historical/cultural context. Taught in English. C-L: Comparative Area Studies. One course. *Gheith*

**178B. Russian Short Fiction in the Original. (AL, FL)** Same as Russian 178A except taught in Russian. C-L: Comparative Area Studies. One course. *Gheith*

**179S. Selected Topics in Russian Literature. (AL)** Women writers of the twentieth century, Soviet film, *samizdat/tamizdat*, the Petersburg paradigm in Russian literature and culture. Taught in English. One course. *Staff*

**181. The Soviet 1920s: The Road to a New Synthesis. (AL)** The literary struggle of the 1920s; proletarian literature from the Smithy to RAPP, LEF and the fate of the avant-garde, the aesthetic conception of Pereval, the literature of the absurd, Oberiu and the Serapion Brothers. Authors include Kirillov, Gladkov, Babel, Pilnyak, Olesha, Zamyatin, Platonov, Kharms, and Pasternak. Taught in English. Not open to students who have taken the former Russian 181, Early Twentieth-Century Russian Literature. C-L: Comparative Area Studies and Perspectives on Marxism and Society. One course. *Lahusen*

**182. Socialist Realism: Soviet Literature of the 1930s and 1940s. (AL)** The Stalin era of Russian literature, the genesis and development of socialist realism, Soviet literature and the themes of boundaries and war. Authors include Sholokhov, Ostrovsky, Fadeev, Azhaev, Babaevsky, Kochetov, and Simonov. Taught in English. C-L: Comparative Area Studies, History 185A, and Perspectives on Marxism and Society. One course. *Lahusen*

**183. Post-Stalinist and Contemporary Soviet Literature. (AL)** Literature of the thaw after Stalin, the young prose, little realism, new modernism, and rural prose. Authors include Aksyonov, Trifonov, Baranskaya, Bitov, Solzhenitsyn, Rasputin, Shukshin, and Zalygin. Taught in English. C-L: Comparative Area Studies. One course. *Lahusen*



**185S. Introduction to Slavic Linguistics. (FL)** Basic introduction to linguistic terminology; emphasis on synchronic linguistic theory in the East, West, and South Slavic areas. Phonological, morphological, and syntactic structure of contemporary standard Russian. Readings in English and Russian. C-L: Comparative Area Studies and Linguistics. One course. *Andrews*

**186S. History of the Russian Language. (AL, FL)** The development of the Russian language from the eleventh century, with consideration of the origins of modern literary and dialectal features. Readings in Russian. Prerequisite: second year Russian or consent of instructor. C-L: Comparative Area Studies and Linguistics. One course. *Andrews*

**190S. Introduction to Russian Civilization. (CZ)** Basic knowledge of Russian society, history of ideas, folklore tradition, orthodoxy, and history of Russian readership. Taught in English. C-L: Comparative Area Studies and History 146S. One course. *Pelech*

**191, 192. Independent Study.** Directed reading and research. Open only to qualified students by consent of director of undergraduate studies. One course each. *Staff*

**193, 194. Independent Study.** Directed reading and research for qualified seniors. Consent of director of undergraduate studies required. One course each. *Staff*

**195. Advanced Russian. (FL)** Advanced grammar review with an emphasis on the refinement of oral and written language skills. Development of writing style through compositions and essays. Prerequisite: Russian 102S or consent of instructor. C-L: Comparative Area Studies. One course. *Andrews or Maksimova*

**196. Advanced Russian: Readings, Translation, and Syntax. (FL)** Intensive reading and conversation with emphasis on contemporary Russian literary and Soviet press texts. English-Russian translation stressed. Russian media, including television and films. Prerequisite: Russian 195 or consent of instructor. C-L: Comparative Area Studies. One course. *Andrews or Maksimova*

**198, 199. Russian Stylistics and Conversation. (AL, FL)** Refinement of stylistic control and range in spoken and written Russian. Emphasis on fluent discursive skills, as well as development of expository prose style. Prerequisites: Russian 195 and 196, or consent of instructor. One course each. *Maksimova*

### **For Seniors and Graduates**

**201S. Topics in Comparative Slavic Linguistics. (SS)** A cycle of survey courses on the phonology, morphology, and dialects of the Slavic languages. Taught in English. Readings in Russian.

- A. East Slavic
- B. West Slavic
- C. South Slavic
- D. Common Slavic

C-L: Comparative Area Studies and Linguistics. One course. *Andrews*

**202. Semiotics of Culture. (AL, CZ)** The theory of literature, arts, ethnicity, modernity, and culture. Texts include the critical works of Lotman and the Tartu School, Bakhtin, Eco, Kristeva, Voloshinov, Medvedev, Barthes, Todorov, Jakobson, Ivanov, and Sebeok. C-L: Cultural Anthropology 202 and English 206. One course. *Andrews*

**203S. Old Church Slavonic. (FL)** Introduction to the language of the earliest Slavic texts. Close study of phonological and morphological systems, reading of texts and discussion. Taught in English. C-L: Linguistics and Religion 229S. One course. *Staff*

**205. Semiotics and Linguistics. (SS)** A survey of modern semiotics, particularly the works of C. S. Peirce and Umberto Eco. Semiotic works directly related to modern linguistic thought and linguistic sign theory. Emphasis on the interdisciplinary aspects of semiotic theory. C-L: English 205 and Linguistics. One course. *Andrews*

**206. Russian Modernism. (AL)** Russian culture between the 1890s and the 1920s, including visual, musical, literary arts, and developments ranging from Neo-Christian mysticism, cosmism, synthesis of the arts, and revolutionary activism. Focus on literary-philosophical thought of that period. Taught in English. One course. *Mickiewicz*

**207S. Semantics. (SS)** Survey of modern semantic theory, including a range of theoretical approaches: communication theory, structuralism, markedness, and generative semantics. Emphasis on lexical meaning and deictic relations. Taught in English. C-L: Linguistics. One course. *Andrews*

**208. Stylistic and Compositional Elements of Scholarly Russian. (FL)** Introduction to Russian texts and terminology including business, economics, law, history, political sciences, psychology, linguistics, and literary criticism. Prerequisite: Russian 64 or consent of instructor. One course. *Maksimova*

**209. Intensive Advanced Stylistics. (AL, FL)** Refinement of stylistic control and range in spoken and written Russian. Emphasis on fluent discursive skills, as well as development of expository prose style. Prerequisites: Russian 195 and 196, or consent of instructor. Two courses. *Maksimova*

**211. Legal and Business Russian. (CZ, FL)** Introduction to Russian language and culture in the area of legal studies and conducting business in or with Russia and other Commonwealth of Independent States countries. Primary materials include contracts, advertising, and financial documents. Prerequisites: Russian 1 and 2 or consent of instructor. One course. *Andrews or Maksimova*

**212S. Proseminar. (AL)** Introduction to research methodologies, professional skills (including discussions of teaching), as well as a theoretical basis for students in Slavic linguistics and literature. Mandatory for all graduate students and open to upper-level undergraduates. Team taught; taught in English and Russian. One course. *Staff*

**213. Silver Age of Russian Literature. (AL)** Poetics of symbolism, acmeism, futurism, imagism, and formalism. Representative world views and critical and artistic methods. Students of Slavic and Russian will read the materials in the original language. One course. *Mickiewicz*

**214. Gender, Nationalities, and Russian Literary Traditions. (AL, CZ)** Russian literature of the nineteenth and twentieth centuries compared with both Western and Eastern literature of the same time period, including questions of national identity. Readings include: Pushkin, Lermontov, Tur, Aitmatov, and Iskander. C-L: Literature 214 and Women's Studies. One course. *Gheith*

**240S. Russian Literary Discourse. (AL)** Nineteenth- and twentieth-century Russian literary theory, with close readings in the original. Application to fiction. Taught in English. One course. *Lahusen*

**245. Theory and Practice of Translation. (FL)** Overview of the scholarly literature on translation combined with a program of practical translation exercises. Prerequisite: three years of Russian language study or consent of instructor. One course. *Flath*

**250. Trends in Russian and East European Literary Criticism and Beyond. (AL)** The major critical movements in the nineteenth and twentieth centuries in Russia, East-Central Europe, and the West. Authors and theories include the Belinsky school, formalism, Bakhtin,

structuralism, semiotics, and psychoanalytic and feminist theory. Taught in English or Russian. Readings in English or Russian. One course. *Gheith*

**257. Law, Culture, and the Russian Legal Tradition. (CZ)** A study of the development of the Russian legal tradition, with particular emphasis on the historical and cultural factors that have contributed to its emergence, comparing the Russian tradition with the Western legal tradition. How law, lawyers, and legal institutions have been portrayed in Russian popular culture, especially Russian literature. Taught in English. One course. *Newcity*

**261. Masterpieces of Nineteenth-Century Russian Literature I. (AL)** Selected nineteenth-century authors, works, and genres. Authors include Pushkin, Lermontov, Gogol, Turgenev, Herzen, Goncharov, and Dostoevsky. Taught in English. Readings in Russian. C-L: Comparative Area Studies. One course. *Staff*

**262. Masterpieces of Nineteenth-Century Russian Literature II. (AL)** Selected authors, works, and genres from the second half of the nineteenth century. Authors include Turgenev, Chernyshevsky, Dostoevsky, Tolstoy, Saltykov-Shchedrin, and Chekhov. Taught in English. Readings in Russian. C-L: Comparative Area Studies. One course. *Staff*

**264. Symbolist Movement in Russia. (AL)** History and theory of the philosophy, poetry, prose, and criticism of the Russian variant of the interdisciplinary and international movement. The momentous movement spawning a variety of other creative schools that constitute twentieth-century Russian modernism. Taught in English. Readings in Russian. One course. *Mickiewicz*

**269. Women and Russian Literature. (AL)** Issues of gender and society in women's writing in Russian from the eighteenth to the twentieth centuries. Both autobiographical writings and prose fiction. Discussions of whether Russian women's writings constitute a tradition and what role these works have played in Russian literature and culture. Taught in English. Readings in Russian. C-L: Comparative Area Studies and Women's Studies. One course. *Gheith*

**272S. Pushkin and His Time. (AL)** Pushkin and the literary revolution around 1830. Prose works (*The Tales of Belkin*, *The Queen of Spades*, *The Captain's Daughter*) and major lyrical poetry. Taught in English. Readings in Russian. One course. *Gheith or Van Tuyl*

**273S. Gogol. (AL)** Life, works, and criticism. Readings include *Dead Souls*, *The Inspector General*, *Petersburg Tales*, and other short fiction. Readings in Russian. One course. *Lahusen*

**275. Tolstoy. (AL)** Introduction to life, works, and criticism. Readings include: *War and Peace*, *Anna Karenina*, the shorter fiction, dramatic works and essays. Taught in English. Readings in Russian. One course. *Van Tuyl*

**276. Dostoevsky. (AL)** Introduction to life, works, and criticism. Readings include: *Crime and Punishment*, *The Idiot*, and *The Brothers Karamazov*. Taught in English. Readings in Russian. C-L: Comparative Area Studies. One course. *Flath, Gheith, or Van Tuyl*

**278. Russian Short Fiction. (AL)** The history, development, and discontinuities of Russian short fiction in the nineteenth and twentieth centuries. Authors include Dostoevsky, Vovchok, Leskov, Chekhov, Gippius, and Zoshchenko. Topics include gender, genre, and national identity in historical/cultural context. Taught in English. C-L: Comparative Area Studies. One course. *Gheith*

**279S. Literature of the Former Soviet Republics. (AL)** Ukrainian realism of the nineteenth century, futurism, neoclassicism, and the literary struggle of the 1920s; Belorussian literature; Lithuanian psychological prose; the Estonian experimental novel; Georgian literature from

Rustaveli to the philosophical novel of the 1970s; the work of Chingiz Aitmatov; Soviet "recent literacy." Taught in Russian. One course. *Staff*

**281. The Soviet 1920s: The Road to a New Synthesis.** (AL) The literary struggle of the 1920s; proletarian literature from the Smithy to RAPP, LEF and the fate of the avant-garde, the aesthetic conception of Pereval, the literature of the absurd, Oberiu and the Serapion Brothers. Authors include Kirillov, Gladkov, Babel, Pilnyak, Olesha, Zamyatin, Platonov, Kharmis, and Pasternak. Readings in Russian. C-L: History 242B. One course. *Lahusen*

**282. Socialist Realism: Soviet Literature of the 1930s and 1940s.** (AL) The Stalin era of Russian literature, the genesis and development of socialist realism, Soviet literature and the theme of boundaries and war. Authors include Sholokhov, Ostrovsky, Fadeev, Azhiev, Babaevsky, Kochetov, and Simonov. Readings in Russian. One course. *Lahusen*

**283. Post-Stalinist and Contemporary Soviet Literature.** (AL) Literature of the thaw after Stalin: the young prose, little realism, new modernism, and rural prose. Authors include Aksyonov, Trifonov, Baranskaya, Bitov, Solzhenitsyn, Rasputin, Shukshin, and Zalygin. Readings in Russian. C-L: Comparative Area Studies. One course. *Lahusen*

**284. Late- and Post-Soviet Literature.** (AL) From the "recovered" avant-garde to the new literature during the Gorbachev era and beyond. The unmasking of Soviet history and its aestheticization. Underground literature and Soviet postmodernism. Authors include Rybakov, Pietsukh, Petrushevskaya, Kuraev, Tolstaya, Viktor Erofeyev, Makanin, Prigov, and Narbikova. Readings in Russian. One course. *Gheith or Lahusen*

**286S. Zamyatin.** (AL) The novel *We*, short fiction, and essays. Taught in English. Readings in English or Russian. Not open to students who have taken the former Russian 177S/277S (Zamyatin). One course. *Andrews, Lahusen, or Maksimova*

**288S. Bulgakov.** (AL) Works include *Master and Margarita*, *The White Guard*, *A Theatrical Novel*, and *The Heart of a Dog*. Readings in English or Russian. One course. *Andrews and Maksimova*

**290. Trifonov, or the Life and Death of the Soviet Intelligentsia.** (AL) The Russian and Soviet intelligentsia, its role and historical responsibility, depicted by one of the most visible representatives of the "generation of the sixties." Works include *The Exchange*, *Taking Stock*, *The Long Goodbye*, *Another Life*, *The House on the Embankment*, *The Old Man*. Readings in Russian. One course. *Staff*

**299S. Special Topics.** Seminars in advanced topics, designed for seniors and graduate students. One course. *Staff*

### Courses Currently Unscheduled

**129. Russian Orthodoxy.** (CZ)

**141, 142. Teaching Practicum.**

**145. Theory and Practice of Translation.** (FL)

**151, 152. Fourth-Year Russian Conversation.** (FL)

**165S. Old Russian Literature.** (AL)

**169. Women and Russian Literature.** (AL)

**173S. Gogol.** (AL)

**180. Early Twentieth-Century Russian Literature: From Symbolism to the 1920s.** (AL)

**184. Late- and Post-Soviet Literature.** (AL)

**187. Intensive Advanced Russian.** (FL)

**188S, 189S. Advanced Russian Language and Culture.** (CZ, FL)

**197. Russian Poetry.** (AL)

**204S. Russian Folklore and Popular Culture.** (CZ, FL)



210. Literature and Criticism of Socialist Realism. (AL)  
 230. Soviet Cinema. (AL) 265S. Literature of Early Russia. (AL)  
 266S. The Sources of Modern Russian Literature: The Eighteenth Century. (AL)  
 277S. Chekhov. (AL)  
 280. Early Twentieth-Century Russian Literature: From Symbolism to the 1920s. (AL)  
 285. Babel and the Russian-Jewish Cultural Dialogue of the Twentieth Century. (AL)  
 287S. Platonov. (AL)  
 298. Akhmatova. (AL)

### BALTO-FINNIC (BF)

- 1, 2. Elementary Estonian. (FL) Introduction to understanding, speaking, reading, and writing Estonian. No preliminary knowledge of Estonian necessary. One course each. *Staff*  
 3, 4. Elementary Finnish. (FL) Introduction to understanding, speaking, reading, and writing Finnish. No preliminary knowledge of Finnish necessary. One course each. *Staff*  
 200. Balto-Finnic Linguistics. (FL) Introduction to Balto-Finnic languages with emphasis on the established literary languages, Finnish and Estonian. Analysis of their phonological and morphological structures. Survey of related nonliterary languages such as Karelian and Vepsian. Taught in English. C-L: Linguistics. One course. *Staff*

### HUNGARIAN (HUN)

- 1-2. Elementary Hungarian. (FL) Introduction to understanding, speaking, reading, and writing Hungarian. Two courses. *Viktorov*

### POLISH (POL)

- 1-2. Elementary Polish. (FL) Introduction to understanding, speaking, reading, and writing Polish. No preliminary knowledge of Polish necessary. Two courses. *Lahusen*  
 63, 64. Intermediate Polish. (FL) Intensive classroom and laboratory practice in spoken and written patterns. Readings in contemporary literature. Prerequisites: Polish 1 and 2, or consent of instructor. One course each. *Lahusen*

### Courses Currently Unscheduled

14. Intensive Elementary Polish. (FL)  
 100. Poland in Transition. (CZ)  
 174S. Topics in Polish Literature. (AL)  
 187. Introduction to Polish Literature. (AL)

### SERBIAN AND CROATIAN (SCR)

14. Intensive Elementary Serbian and Croatian. (FL) Serbian and Croatian 1 and 2 combined in one semester. Two meetings daily. Required recording-listening practice in the language laboratory. Work on understanding, speaking, reading, and writing. Survey of main elements of grammar. No preliminary knowledge of Serbian and Croatian necessary. Two courses. *Andrews*

### Courses Currently Unscheduled

- 1-2. Elementary Serbian and Croatian. (FL)  
 63, 64. Intermediate Serbian and Croatian. (FL)  
 70. Intensive Intermediate Serbian and Croatian. (FL)

## UKRAINIAN (UKR)

**1-2. Elementary Ukrainian. (FL)** Introduction to understanding, speaking, reading, and writing Ukrainian. No preliminary knowledge of Ukrainian necessary. Two courses. *Staff*

### Courses Currently Unscheduled

**14. Intensive Elementary Ukrainian. (FL)**

**187. Introduction to Ukrainian Literature. (AL)**

## THE MAJOR

*Major Requirements.* A minimum of ten courses in the department, eight of which must be at the 100 level or above. All majors must take the following courses: Russian 63, 64, 101S, 102S, 195, 196 or equivalent. Each major is additionally required to take four courses, of which at least two have a primary focus on Russian literature. The department urges students to consider coursework that would include at least one 200-level course.

### Graduation with Distinction

The department offers work leading to graduation with distinction. See the section on honors in this bulletin and the departmental director of undergraduate studies.

## THE MINOR

*Requirements.* Five courses, three of which must be at the 100 level or above.

## Sociology (SOC)

Professor Spenner, *Chair*; Professor George, *Director of Undergraduate Studies*; Professors K. Cook, DiPrete, Gereffi, Land, Lin, Morgan, Simpson, Tiryakian, and Wilson; Associate Professors O'Rand and Zhou; Assistant Professors Buchmann, Gao, Jackson, Shanahan, and Thornton; Professors Emeriti Back, Kerckhoff, Maddox, Myers, Preiss, and Smith; Adjunct Professors Carroll (religion), P. Cook (public policy), Lewin (business), and O'Barr (cultural anthropology); Adjunct Associate Professor Gold (psychiatry and aging center); Adjunct Research Professor Manton (demographic studies); Scholar-in-Residence Gittler; Lecturers Bach and Williams

A major or minor is available in this department.

Sociology combines an appreciation of human beings' capacity for self-realization with a scientific understanding of the causes and consequences of their social behavior. Each course aims to develop both the analytical and critical skills necessary for understanding and evaluating social institutions and social change. Emphasis is upon contemporary research and the use of sociological data in tackling social problems. Active involvement in the learning process is fostered through seminars, independent study, honors work, and internships.

**10D. Introduction to Sociology. (SS)** Structure and dynamics of groups, organizations, and institutions; social behavior over the life cycle; social control and deviance; population and social ecology; formation and change of societies. One course. *Bach or Shanahan*

**11. Contemporary Social Problems. (SS)** A survey of approaches to the study of current social problems and social trends. Sexism, racism, age discrimination; job displacement by technological change; social consequences of environmental pollution; unemployment and poverty; interpersonal problems associated with changes in family structures; maldistribution of health care and educational opportunities; deviance. One course. *Land or Simpson*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**98. Introduction to Canada.** (SS) See C-L: Canadian Studies 98; also C-L: Comparative Area Studies, Economics 98, History 98, and Political Science 98. One course. *Staff*

**101A, S. Contemporary American Society.** (SS) Social trends and problems and their effects on individuals and society. Urbanization; bureaucracy; distribution of wealth, income, and power; status of minorities. Open only to students in the FOCUS Program. One course. *Simpson or Spenner*

**101B, S. Science and Technology in Twentieth-Century America.** (SS) Science and technology as embedded in social and political institutions that constrain and promote their development over time. The complex and dynamic set of relations during the twentieth century across scientific and technological domains (for example, cybernetics, atomic energy, and biotechnology). Particularly controversial events and theories that illustrate these relations. Open only to students in the FOCUS Program. One course. *O'Rand*

**101C, S. A Single Europe? Dreams and Reality.** (SS) Twentieth-century forces and happenings which undergird the notion of a "Single Europe," twelve hundred years after its ancestral beginnings with Charlemagne. Structural, ideological, and leadership factors that seek, after two calamitous world wars, to renovate the European community into a broad socioeconomic and perhaps even political union. Open only to students in the FOCUS Program. One course. *Tiryakian*

**101E, S. The Political Economy of East Asia: From Nation-State to Regional Cooperation.** (SS) The Asian-Pacific regions emerging as the center of international political economy in the next century. Emphasis on China, Japan, South Korea, Taiwan, and Hong Kong; focus on how East Asian countries responded to the great challenge of industrialization in the nineteenth and twentieth centuries, what kind of impact the industrialization exerted on their cultures and societies, and what the significance of ongoing regional cooperation in this region will be to the new order of international politics and economy in the post cold war era. Open only to students in the FOCUS Program. One course. *Gao*

**103. Sexuality and Culture in America.** (SS) See C-L: Cultural Anthropology 103; also C-L: Study of Sexualities, and Women's Studies. One course. *Luttrell*

**106. Social Psychology.** (SS) See C-L: Psychology 116; also C-L: Women's Studies. One course. *Costanzo, Fischer, George, or staff*

**107. Bargaining, Power, and Influence in Social Interaction.** (SS) How power and influences are exercised, conflict is handled, cooperation promoted, and agreements negotiated in social groups. Related issues in the study of social interaction, such as the role of emotion. One course. *Cook or Spenner*

**109. Introduction to North America.** (CZ, SS) See C-L: North American Studies 110; also C-L: Cultural Anthropology 129, Economics 115, History 108F, Latin American Studies, Political Science 119, Public Policy Studies 115, and Romance Studies 125. One course. *Thompson*

**110, A-E. Comparative Sociology: Selected Areas.** (SS) Comparative studies of selected areas of the world, considering differences and similarities in culture and communication, family, law and social control, urban forms and the organization of work. Areas vary each semester offered and are designated by letter.

A. Africa

B. Asia

C. Europe

D. Latin America

E. Cross-Regional

C-L: Comparative Area Studies. One course. *Gao, Gereffi, Lin, or Tiryakian*

**111. Social Inequality: An International Perspective. (SS)** The nature, forms, and socioeconomic bases of inequality. Age, gender, race, ethnicity, class, region, and family as dimensions of inequality. Variations in the structure of inequality over time and across nations. How educational institutions, economic development, work institutions, and state welfare programs affect the shape of inequality. Social inequality and social mobility. C-L: Women's Studies. One course. *DiPrete or O'Rand*

**112. American Demographics. (SS)** Examination of trends in the fertility, migration, geographic distribution, and composition of the United States population. Consequences for lifestyles, social trends, consumer markets, health care, and public policy. One course. *Land or Morgan*

**116. Race and Ethnic Relations. (SS)** History and changing nature of race and ethnic relations, with special reference to the United States. Sources, forms, and consequences of racial discrimination; movements for racial integration and separatism; the intersection of race, class, and gender. C-L: African and African-American Studies 116. One course. *Jackson*

**117. Childhood in Social Perspective. (SS)** Social forces affecting the place and purpose of children in society, their relations to adults and their treatment by social institutions such as schools and governments. Topics include parent-child relations, sibling relations, child abuse, children's rights, child labor, and the portrayal of children in the mass media. One course. *Simpson*

**118. Sex, Gender, and Society. (SS)** Nature and acquisition of sex roles. Cross-cultural variations. Developing nature of sex roles in American society. C-L: Comparative Area Studies, Study of Sexualities, and Women's Studies. One course. *Buchmann or O'Rand*

**119. Juvenile Delinquency. (SS)** Environments in which juvenile delinquency develops; delinquent subcultures and peer groups; societal reactions to delinquency in schools, courts, and other agencies. One course. *Land*

*Sociology 120, 122, and 123 are designed as a sequence and might optimally be taken in that order, with Sociology 120 being recommended preparation for 122 and 123. However, there are no prerequisites.*

**120. Causes of Crime. (SS)** Definition, types, and extent of crime; biological, psychological, economic, and social causes of criminality; explanation and critical evaluation of theories of crime; structure and patterns of recruitment of criminal organizations; social reactions to crime and the justice system. One course. *Land*

**122. Punishment and Treatment of Deviants. (SS)** Concepts of punishment and rehabilitation. Programs and facilities for deviants. Structure and operation of "total" institutions, such as prisons and hospitals. Problems of returning to family and community life. One course. *Staff*

**123. Social Aspects of Mental Illness. (SS)** Theoretical and practical sociological contributions to problems of etiology, definition, law, and treatment; comparisons with other contributions; questions of public policy and programs. One course. *George or Jackson*

**124. Human Development. (SS)** Especially for sophomores. Juniors and seniors by consent only. See C-L: Human Development 124; also C-L: Psychology 124. One course. *Gustafson, Maxson, or staff*



**125. Comparative Approaches to Global Issues.** (CZ, SS) Not open to students who have taken Religion 121. See C-L: Comparative Area Studies 125; also C-L: Cultural Anthropology 125, History 137, Perspectives on Marxism and Society, Political Science 125, and Religion 183. One course. *Staff*

**126. Third World Development.** (SS) Theories concerning the role of transnational corporations and international financial institutions (for example, World Bank) in the development of Third World nations, assessed with the aid of sociological and economic data. C-L: Comparative Area Studies and Latin American Studies. One course. *Buchmann or Gereffi*

**132. Methods of Social Research.** (SS) Principles of social research, design of sociological studies, sampling, and data collection with special attention to survey techniques. One course. *George or Lin*

**133. Statistical Methods.** (QR) Elementary statistical techniques and their application to the analysis and interpretation of social science data. Theory of inference is stressed. C-L: Psychology 117. One course. *Land or Spenner*

**138D. History of Social Thought.** (SS) Theories of society and social relations in the writings of Montesquieu, Rousseau, Comte, Marx, Weber, Durkheim, Simmel, Veblen, Sorokin, and others. The history of sociology in relation to philosophical currents, social movements, and transformation of the modern world. Two lectures and one discussion. C-L: Comparative Area Studies. One course. *Tiryakian or Wilson*

**139. Marxism and Society.** (SS) See C-L: Cultural Anthropology 139; also C-L: Comparative Area Studies, Education 139, History 186, Literature 181, and Perspectives on Marxism and Society. One course. *Staff*

**141. Consuming Passions.** (SS) Consumption as the appropriation of meaning to express individual and collective identity, social forces leading to the rise of societies organized around consumption, global diffusion of consumer culture, social dynamics of change in consumption (for example, fashion), and social constraints on consumption (for example, environmentalism). One course. *Gao or Wilson*

**142. Organizations and Global Competitiveness.** (SS) Competition between national economies as understood in the context of social factors such as ethnicity, kinship, gender, education, with a special emphasis on the role of multinational corporations, public bureaucracies, and small firms. C-L: Comparative Area Studies and Markets and Management Studies. One course. *Buchmann or Gereffi*

**143. Management and Labor Relations.** (SS) Theories and current research on the interlocking roles of business and labor in the United States and elsewhere. C-L: Comparative Area Studies. One course. *Gereffi or Thornton*

**144. Organizations and Environments.** (SS) How organizations (governments, cultures, and technology) are affected by the environment in which they must operate. Competitive strategies (for example, takeovers and mergers); corporate cultures (for example, United States versus Japan); and the impact of technology. C-L: Markets and Management Studies. One course. *Gao or Thornton*

**145. Nation, Regions, and the Global Economy.** (SS) The changing configuration of global capitalism, with emphasis on comparing global regions (North America, Latin America, Europe, Africa, and Asia). The internal dynamics of these regions, including the development strategies of selected nations, interregional comparisons (for example, regional divisions of labor, state-society relationships, the nature of their business systems, quality of life issues). C-L: Comparative Area Studies. One course. *Buchmann, Gereffi, or Shanahan*

**146. Organizational and Occupational Deviance. (SS)** Organizational and occupational deviance ("white collar crimes") rooted in the structure and workings of modern organizations, for example, business corporations, nonprofit agencies and religious institutions, government bureaucracies. Violations of regulatory standards, corporate fraud, and unethical occupational conduct identifying the characteristics of offending organizations and offenders. Various control mechanisms, such as regulatory agencies, the media, and whistle-blowing. One course. *Simpson or Thornton*

**149. Sexuality and Society. (SS)** Sociocultural factors affecting sexual behavior. Changing beliefs about sex; how sexual knowledge is socially learned and sexual identities formed; the relation between power and sex; control over sexual expression. C-L: Study of Sexualities and Women's Studies. One course. *Bach or Tiryakian*

**150. The Changing American Family. (SS)** Structure, organization, and social psychology of marital, parental, and sibling relations over the life cycle of a family; courtship, marriage, family dissolution in relation to contemporary American society; deviations from and alternatives to the traditional nuclear family. C-L: Women's Studies. One course. *Simpson*

**151. Sociology of Religion. (SS)** The religious factor in modern society and the social factor in modern religion. Major sociological theories and marginal religious groupings. One course. *Tiryakian or Wilson*

**153. Sport and Society. (SS)** The effect of sports on people, their self-image, and social roles. Relation of sports as an institution to the family, education, economics, and politics. One course. *Wilson*

**155. Organizations and Management. (SS)** Forms of work organization (corporations, government agencies), the social forces shaping them (management styles, technology, government policy, labor markets), and their effects on employees (productivity, work satisfaction, turnover). C-L: Markets and Management Studies and Women's Studies. One course. *DiPrete, Thornton, or Zhou*

**156. Global Contexts of Science and Technology. (SS)** National variations in the structures of scientific systems, and their consequences for the production and application of scientific knowledge, paying particular attention to how these variations are shaped by national differences in politics, economics, and education. Special focus on recent developments in the biomedical sciences, such as genetic engineering and bio-ecology. One course. *O'Rand*

**158. Markets and Marketing. (SS)** Markets as systems of social exchange: how they are organized and developed; their relationship to other social structures such as families, work organizations, and the state; their impact on individuals, careers, consumption patterns, and lifestyles. C-L: Markets and Management Studies. One course. *DiPrete or Spenner*

**159. The Sociology of Entrepreneurship. (SS)** The social origins and careers of entrepreneurs. The interrelation of their work and family roles and the distinctiveness of their values and interests. The role of entrepreneurial activity in societal development, and its function in different industries, ethnic groups, and societies. C-L: Markets and Management Studies. One course. *Thornton*

**160. Advertising and Society: Global Perspective. (SS)** See C-L: Cultural Anthropology 110; also C-L: Canadian Studies, Comparative Area Studies, English 120, Film and Video, Linguistics, and Women's Studies. One course. *Luttrell, O'Barr, or Wilson*

**161. Adulthood and Aging. (SS)** Sociological and psychological perspectives on aging, from adolescence through old age and death; demography of human aging; problems caused by

- increased longevity; policy issues. C-L: Women's Studies. One course. *George, Gold, or O'Rand*
- 162. Health and Illness in Society.** (SS) Relations between patients and health professionals, and utilization of resources for health care. One course. *Jackson or Lin*
- 163. Aging and Health.** (SS) Illness and health care utilization among the elderly, comparison to other populations, gender and race differences, medicare and medicaid, individual adjustment to aging and illness, social support for sick elderly, the decision to institutionalize, policy debate over euthanasia. One course. *George or Gold*
- 165. Occupations, Professions, and Careers.** (SS) How occupations organize and control labor markets, define services, chart career lines, and develop and sustain occupational identities. C-L: Women's Studies. One course. *O'Rand, Simpson, or Spenner*
- 169. Psychosocial Aspects of Human Development.** (SS) See C-L: Human Development 180; also C-L: Psychology 130. One course. *Gold*
- 170. Mass Media.** (SS) An analysis of the role of radio, the press, magazines, movies, and television. An examination of the selective audiences, content characteristics, controlling elements, and organizational structure of the various media. Comparative Canadian material considered where feasible. C-L: Canadian Studies, Comparative Area Studies, and Film and Video. One course. *Staff*
- 171. Comparative Health Care Systems.** (SS) The interaction of historical, political, economic, legal/ethical, and sociological factors in the organization and operation of health care systems in the United States, the United Kingdom, Sweden, and elsewhere. C-L: Canadian Studies, Comparative Area Studies, and Health Policy. One course. *Staff*
- 175. Contemporary Global Issues.** (SS) See C-L: Comparative Area Studies 109; also C-L: Cultural Anthropology 109, History 109, and Political Science 160. One course. *Staff*
- 182. Media in Comparative Perspective.** (SS) Impact of mass media outside the United States. Cross-national comparisons of media content, audiences, and control. Relationships of governments to media and media policies. International flow of media materials and their cross-national impact. C-L: Canadian Studies, Comparative Area Studies, Film and Video, and Political Science 180. One course. *Staff*
- 184S. Canadian Issues.** (SS) Prerequisite: Canadian Studies 98 or consent of instructor. See C-L: Canadian Studies 184S; also C-L: Comparative Area Studies, Cultural Anthropology 184S, Economics 184S, History 184S, and Political Science 184S. One course. *Staff*
- 185S. The Canadian Health Care System.** (SS) See C-L: Canadian Studies 185S; also C-L: Comparative Area Studies, Cultural Anthropology 185S, Economics 185S, History 108E, Political Science 185S, and Public Policy Studies 187S. One course. *Warren*
- 188B, S. Colonialism, Ethnicity, and Gender in Postrevolutionary Bolivia.** (CZ, FL) Analysis of Latin American colonialism and ethnicity based on the writings of Balandier and Casanovas. Special emphasis on Bolivian colonialism as reflected in Andean oral history and the institutionalization of the Indian movement. The situation of Aymara-speaking women and their role in the informal economy of La Paz and El Alto. (Taught in Spanish in Bolivia.) C-L: Cultural Anthropology 199E, Latin American Studies, Spanish 132B, and Women's Studies. One course. *Staff*
- 188C. East Asian Political Economy: Institutions, Networks, and Politics.** (SS) Investigation of new frontiers of East Asian political economy. How institutions, networks, and coalition politics influence policy choice and economic performance in East Asian countries. Primary focus on Korea and Taiwan with comparison to Japan. (Taught in Korea



and Taiwan.) C-L: Comparative Area Studies, Political Science 100V, and Public Policy Studies 100A. One course. *Staff*

**190. Markets and Management.** (SS) Capstone course for students in the Markets and Management Studies Certificate Program and open only to them. Includes review of major perspectives and concepts from the program's core courses, and production of a major case study research project. C-L: Markets and Management Studies. One course. *DiPrete, Gereffi, Simpson, Spenner, or Thornton*

**191-192. Markets and Management Studies Internship.** A two-semester, one-credit sequence, open to students in the Markets and Management Studies Program (and to others on space-available basis) who are planning to pursue an internship in a business-related setting. 191, typically taken in the spring, involves conceptualization of an intellectual problem that will be investigated in the internship. 192, typically taken in the fall, involves production of a paper based on the internship experience and containing substantive research and analysis. To receive course credit, students must successfully complete both 191 and 192. Counts as an approved elective toward the certificate. Consent of director of Markets and Management Studies Program required. One course. *Staff*

**193, 194. Independent Study.** Consent of instructor required. One course each. *Staff*

**195S, 196S, 197S. Seminar in Special Topics.** One course each. *Staff*

**198. Special Topics in Sociology.** Topics vary each semester. One course. *Staff*

#### **For Seniors and Graduates**

**206. Sociological Theory.** (SS) Structure, foundations, and historical antecedents of recent formulations of such theoretical approaches as phenomenological sociology, exchange theory, critical theory, structuralism, neo-Marxist sociology, sociobiology, and action theory. One course. *Tiryakian or Wilson*

**207. Social Statistics I: Basic Concepts and Methods.** (QR) Review of descriptive statistics; probability concepts; statistical inference, t-tests, and the analysis of variance. Bivariate correlation and regression, dummy variables, multiple regression, and the analysis of covariance. Stress on applications. Statistical computing using SPSS and other programs. One course. *DiPrete or Land*

**208. Survey Research Methods.** (SS) Theory and application of survey research techniques in the social sciences. Sampling, measurement, questionnaire construction and distribution, pretesting and posttesting, response effects, validity and reliability, scaling of data, data reduction and analysis. Prerequisite: Sociology 207 or the equivalent. One course. *Lin or staff*

**211S, A-E. Proseminars in Sociological Theory.** (SS) Development of sociological thought; systematic sociological theory; interrelations with other social and behavioral sciences.

- A. Background of Sociology
  - B. Formal Aspects of Theory
  - C. Sociology of Knowledge
  - D. Evolutionary Theory and Sociobiology
  - E. Special Topics in Sociological Theory
- One course. *Tiryakian or Wilson*

**212. Social Statistics II: Linear Models, Path Analysis, and Structural Equation Systems.** (QR) Model specification, review of simple regression, the Gauss-Markov theorem, multiple regression in matrix form, ordinary and generalized least squares, residual and influence analysis. Path analysis, recursive and nonrecursive structural equation models;



measurement errors and unobserved variables. Application of statistical computing packages. Prerequisite: Sociology 207 or equivalent. One course. *DiPrete or Land*

**213. Social Statistics III: Discrete Multivariate Models. (QR)** Assumptions, estimation, testing, and parameter interpretation for the log-linear, logit, logistic, and probit models. Model comparisons; applications of statistical computing packages and programs. Prerequisite: Sociology 212 or equivalent. One course. *DiPrete or Land*

**214. Comparative and Historical Methods. (SS)** Introduction to the theory of comparative research and analysis in the social sciences with special emphasis on comparative methods, quasi-experimental designs, and case studies. C-L: Comparative Area Studies and Political Science 217. One course. *Gereffi, Lin, or Tiryakian*

**215. Basic Demographic Methods and Materials. (SS)** Population composition, change, and distribution. Methods of standardizing and decomposing rates, life tables and population models, analysis of data from advanced and developing countries. Applications of computer programs for demographic analysis. Prerequisite: Sociology 207 or equivalent. One course. *Morgan*

**217S, A-F. Proseminars in Social Statistics and Research Methods. (SS)** Selected topics in the collection and analysis of social science data.

- A. Discrete and Continuous Models of Measurement
  - B. Hazards Models, Event History Analysis, and Panel Data
  - C. Dynamic Models and Time Series Analysis
  - D. Research Design
  - E. Evaluation Research Methods
  - F. Special Topics in Social Statistics and Research Methods
- One course. *DiPrete or Land*

**221S, A-D. Proseminars in Aging and Life Course Analysis. (SS)** Selected topics in socialization, human development, status attainment and careers, and the sociology of aging.

- A. Social Structure and the Life Course
  - B. Social Patterns of Personal Development
  - C. Social Gerontology
  - D. Special Topics in Aging and Life Course Analysis
- One course. *George, Jackson, or O'Rand*

**222S, A-G. Proseminars in Comparative and Historical Sociology. (SS)** Selected topics in the differentiation and transformation of societies.

- A. Theories of Social Change
  - B. Globalization and Comparative Development
  - C. Societal Transformations and Social Institutions
  - D. Culture, Values, and Ideas
  - E. Social Movements and Political Sociology
  - F. Comparative Social Policies
  - G. Special Topics in Comparative and Historical Sociology
- One course. *Buchmann, Gao, Gereffi, Lin, Simpson, or Tiryakian*

**223S, A-E. Proseminars in Crime, Law, and Deviance. (SS)** Selected topics in crime and the institutions of social control.

- A. Theories of Crime Causation
  - B. Human Development and Criminal Careers
  - C. Social Control and the Criminal Justice System
  - D. Sociology of Law
  - E. Special Topics in Crime, Law, and Deviance
- One course. *Land, Simpson, or Wilson*

**224S, A-F. Proseminars in Population Studies. (SS)** Selected topics.

- A. Population Dynamics
  - B. Mortality, Morbidity, and Epidemiology
  - C. Urbanization and Migration
  - D. Demography of the Labor Force
  - E. Demography of Aging
  - F. Special Topics in Population Studies
- One course. *DiPrete, Land, Manton, Morgan, or O'Rand*

**225S, A-H. Proseminars in Organizations, Markets, and Work. (SS)** Selected topics in complex organizations, the labor process, and changing occupations.

- A. Basic Concepts, Theories, and Methods
  - B. Organizations and Environments
  - C. Social Psychology of Organizations
  - D. Markets and Market Systems
  - E. Careers and Labor Markets
  - F. Sociology of Work and Industrial Relations
  - G. Special Topics I: Micro Issues
  - H. Special Topics II: Macro Issues
- One course. *DiPrete, Gao, O'Rand, Spenner, or Thornton*

**226S, A-G. Proseminars in Social Institutions and Processes. (SS)** Selected topics in the sociology of institutions and social and institutional behavior.

- A. Social Psychology
  - B. Social Stratification
  - C. Political Sociology
  - D. Sociology of Religion
  - E. Sociology of Science
  - F. Sociology of Education
  - G. Special Topics in Social Institutions and Processes
- One course. *Staff*

**227S, A-D. Proseminars in Medical Sociology. (SS)** Selected topics in medical sociology.

- A. Social Structure and Health
  - B. Social Behavior and Health
  - C. Organization and Financing of Health Care
  - D. Special Topics in Medical Sociology (for example, social epidemiology, stress and coping, health and aging)
- One course. *George, Gold, Jackson, Lin, or Thornton*

**228S, A-F. Proseminars in Stratification, Mobility, and Labor Force Behavior. (SS)** Core and special topics in social stratification, including explanations for the existence, amount, and various dimensions of stratification in society; institutions that produce stratification; forces that cause the structure of stratification to vary both over time and across societies; and structures that govern social mobility within and across generations.

- A. Intergenerational Mobility
  - B. Social Structure and the Life Course
  - C. Social Inequality and the Structure of Poverty
  - D. Careers and Labor Markets
  - E. Societal Transformation
  - F. Special Topics in Stratification and Mobility Research
- One course. *Buchmann, DiPrete, Lin, Spenner, or O'Rand*

**229S, A-F. Proseminars in Social Psychology. (SS)** Selected topics in microsociology and social psychology, including social interaction, decision making, social exchange, group processes, intergroup relations, self and identity, social structure and personality, social networks, and applications in organizations and health care.

A. Introduction to Social Psychology

B. Rational Choice and Social Exchange

C. Sociology of Self and Identity

D. Group Processes and Intergroup Relations

E. Experimental Research: A Practicum

F. Special Topics in Social Psychology

One course. *Cook, George, Jackson, Lin, or Spenner*

**234S. Political Economy of Development: Theories of Change in the Third World. (SS)** See C-L: Political Science 234S; also C-L: Comparative Area Studies, Cultural Anthropology 234S, and History 234S. One course. *Staff*

**282S. Canada. (SS)** See C-L: Canadian Studies 282S; also C-L: Comparative Area Studies, Cultural Anthropology 282S, Economics 282S, History 282S, and Political Science 282S. One course. *Staff*

**283S. Seminar in North American Studies. (CZ)** See C-L: North American Studies 283S; also C-L: Cultural Anthropology 283S, History 283S, Political Science 285S, Public Policy Studies 282S, and Romance Studies 283S. One course. *Staff*

**291. Research Methods in Japanese. (SS)** Consent of instructor required. See C-L: Japanese 291; also C-L: Cultural Anthropology 290, History 292, and Political Science 291. One course. *Staff*

**298S, 299S. Seminar in Selected Topics.** Substantive, theoretical, or methodological topics. One course each. *Staff*

## **COURSES CURRENTLY UNSCHEDULED**

**157. The Legal Profession and the Law. (SS)**

**167. The Social Bases of Politics. (SS)**

**173. Social Conflict and Social Movements. (SS)**

**179. Modern Nationalist Movements. (SS)**

**188A. The Sociology of Contemporary Spain. (SS)**

**216. Advanced Methods of Demographic Analysis. (SS)**

## **THE MAJOR**

*Prerequisite.* Sociology 10D or, under exceptional circumstances, an equivalent course (Sociology 11, 49S) with the consent of the director of undergraduate studies.

*Major Requirements.* Nine courses, eight of which must be at the 100 level or above, including Sociology 132, Sociology 138, and Statistics 110C, and one seminar or independent study in sociology. Only one independent study credit can be applied to the major (with the exception of an honors thesis).

A *Handbook for Sociology Majors*, available in the office of the director of undergraduate studies, describes areas of concentration, the honors program, and the Sociology Union. It also describes the departmental advising system and the interests of the faculty.

## **THE MINOR**

Five minors are offered by the department, as listed below:

**Sociology: Comparative Sociology**

*Requirements.* Sociology 110 plus any four of the following: Sociology 126, 142, 156, 171, 179, or 182.

**Sociology: Contemporary Social Issues**

*Requirements.* Sociology 117, 149, 150, 151, and 170.

**Sociology: Criminology**

*Requirements.* Sociology 11, 119, 120, 122, and 123.

**Sociology Medical Sociology**

*Requirements.* Sociology 112, 123, 162, 163, and 171.

**Sociology: Social Inequality**

*Requirements.* Sociology 111, 112, 116, 118, and 165.

**Institute of Statistics and Decision Sciences (STA)**

Professor West, *Director*; Associate Professor Johnson, *Director of Undergraduate Studies*; Professors Berry, Sacks, and Winkler; Associate Professors Burdick, Lavine, Reckhow, and Wolpert; Assistant Professors Clyde, Higdon, Muller, Parmigiani, Stangl, and Vidakovic; Adjunct Professor Smith; Adjunct Assistant Professor Sanso

The Institute of Statistics and Decision Sciences coordinates teaching and research in statistics and decision theory at Duke. It offers various courses in basic statistics and advanced mathematical statistics. The research emphasis on statistical decision theory in the institute leads to its offering a variety of courses, at various levels, in statistics and decision sciences. There is no undergraduate major in statistics. The institute maintains and runs a Statistical Consulting Center which provides help on statistical problems and projects for members of the Duke community.

**10D. Basic Statistics. (QR)** Statistical concepts involved in making inferences, decisions, and predictions from data. Emphasis on applications, not formal technique. Not open to students who have had Political Science 138, Psychology 117, Public Policy Studies 112, Sociology 133, or Statistics 110, 112, 113, 114, or 115. One course. *Staff*

**104. Probability. (QR)** Prerequisite: Mathematics 103. See C-L: Mathematics 135. One course. *Staff*

**110A. Statistics and Data Analysis in the Social Sciences. (QR)** Descriptive statistics. Probability and its role in statistical inference. Confidence intervals. Tests of significance. Introduction to linear regression modeling. Not open to students who have had Mathematics 136 or Statistics 110B, 110C, 110E, 112, 113, 114, 210A, 210B, or 213. One course. *Staff*

**110B. Statistics and Data Analysis in Economics. (QR)** Descriptive statistics. Probability and its role in statistical inference. Confidence intervals. Tests of significance. Introduction to linear regression modeling. Emphasis on applications in economics. Not open to students who have had Mathematics 136, Statistics 110A, 110C, 110E, 112, 113, 114, 210A, 210B, or 213. One course. *Staff*

**110C. Statistics and Data Analysis in Public Policy and Sociology. (QR)** Descriptive statistics. Probability and its role in statistical inference. Contingency tables. Analysis of variance. Correlation. Linear regression. Confidence intervals. Tests of significance. Bayesian methods. Emphasis on applications in public policy and sociology. Not open to students who have had Mathematics 136, Statistics 110A, 110B, 110E, 112, 113, 114, 210A, 210B, or 213. One course. *Staff*



**110E. Statistics and Data Analysis in Psychology and Biological Sciences. (QR)** Descriptive statistics. Probability and its role in statistical inference. Confidence intervals. Tests of significance. Introduction to linear regression modeling. Emphasis on applications in psychology and biological sciences. Not open to students who have had Mathematics 136, Statistics 110A, 110B, 110C, 112, 113, 114, 210A, 210B, or 213. One course. *Staff*

**112S. Introduction to Applied Statistics. (QR)** Classical techniques of testing and estimation. Emphasis on applications of the theory to applied problems. Not open to students who have taken Statistics 213 or equivalent. Prerequisite: Mathematics 32 or equivalent, or consent of instructor. One course. *Staff*

**113. Probability and Statistics in Engineering. (QR)** Introduction to probability, independence, conditional independence, and Bayes' theorem. Discrete and continuous, univariate and multivariate distributions. Linear and nonlinear transformations of random variables. Classical and Bayesian inference, decision theory, and comparison of hypotheses. Experimental design, statistical quality control, and other applications in engineering. Not open to students who have taken Statistics 112 or 213. Prerequisite: Mathematics 103 or equivalent. One course. *Staff*

**114. Statistics. (QR)** Prerequisites: Mathematics 104 and 135. See C-L: Mathematics 136. One course. *Staff*

**191, 192. Independent Study.** Directed reading and research. Consent of instructor and director of undergraduate studies required. One course each. *Staff*

**205. Probability and Measure Theory. (QR)** Introduction to probability spaces, the theory of measure and integration, random variables, and limit theorems. Distribution functions, densities, and characteristic functions; convergence of random variables and of their distributions; uniform integrability and the Lebesgue convergence theorems. Weak and strong laws of large numbers, central limit theorem. Prerequisites: elementary real analysis and elementary probability theory. One course. *Wolpert*

**207. Probability. (QR)** Not open to students who have taken Mathematics 290. Prerequisite: Mathematics 241 or equivalent. See C-L: Mathematics 287. One course. *Staff*

**210B. Statistics and Data Analysis in Biological Science. (QR)** Elements of statistical inference and estimation including exploratory data analysis, regression, and analysis of variance. Emphasis on biological science applications. Not open to students who have had Mathematics 136 or Statistics 110A, 110B, 110C, 110E, 112, 113, 114, 210A, or 213. C-L: Environment 251. One course. *Staff*

**213. Introduction to Statistical Methods. (QR)** Emphasis on classical techniques of hypothesis testing and point and interval estimation, using the binomial, normal, t, F, and chi square distributions. Not open to students who have had Statistics 114 or Mathematics 136. Prerequisite: Mathematics 103 (may be taken concurrently) or equivalent, or consent of instructor. One course. *Staff*

**214. Probability and Statistical Models. (QR)** An introduction to applied probability and to the parametric probability models commonly used in statistical analysis. The generation of random variables with specified distributions, and their use in simulation. Mixture models; linear regression models; random walks, Markov chains, and stationary and ARMA process; networks and queueing models. Prerequisites: Statistics 213 and 244 or consent of instructor. One course. *Staff*

**215. Statistical Inference. (QR)** Classical, likelihood, and Bayesian approaches to statistical inference. Foundations of point and interval estimation, and properties of estimators (bias, consistency, efficiency, sufficiency, robustness). Testing: Type I and II errors, power, likelihood ratios; Bayes factors, posterior probabilities of hypotheses. The predictivist perspective. Applications include estimation and testing in normal models; model choice and criticism. Prerequisites: Statistics 213 and 244 or consent of instructor. One course. *Staff*

**216. Generalized Linear Models. (QR)** Likelihood-based inference in generalized linear models (GLIMs). Multiple linear regression, theory, and practice. Elements of Bayesian analyses of linear models. Theory of likelihood-based inference for GLIMs. Factor variables and cross-classified data arrays. Discrete models: binary regressions and simple contingency tables. Introduction to log-linear models. Data analysis: model fitting, model choice, and residuals-based diagnostics. Prerequisites: Statistics 213 and 244 or consent of instructor. One course. *Staff*

**226. Statistical Decision Theory. (QR)** Formulation of decision problems; criteria for optimality: maximum expected utility and minimax. Axiomatic foundations of expected utility; coherence and the axioms of probability (the Dutch Book theorem). Elicitation of probabilities and utilities. The value of information. Estimation and hypothesis testing as decision problems: risk, sufficiency, completeness and admissibility. Stein estimation. Bayes decision functions and their properties. Minimax analysis and improper priors. Decision theoretic Bayesian experimental design. Combining evidence and group decisions. Prerequisite: Statistics 215 or consent of instructor. One course. *Staff*

**242. Applied Regression Analysis. (QR)** Linear regression using both graphical and numerical methods. Model construction, critique, and correction using graphical residual analysis. One-way and two-way analysis of variance; introduction to design of experiments. Use of a standard statistical software package. Applications and examples drawn from various sources, emphasizing the biological and environmental sciences. Prerequisite: Statistics 210B or equivalent. C-L: Environment 255. One course. *Staff*

**244. Linear Models. (QR)** Multiple linear regression and model building. Exploratory data analysis techniques, variable transformations and selection, parameter estimation and interpretation, prediction, Bayesian hierarchical models, Bayes factors and intrinsic Bayes factors for linear models, and Bayesian model averaging. The concepts of linear models from Bayesian and classical viewpoints. Topics in Markov chain Monte Carlo simulation introduced as required. Corequisite: Statistics 213 or equivalent. C-L: Mathematics 217. One course. *Staff*

**245. Introduction to Multivariate Statistics. (QR)** Multinormal distributions, multivariate general linear model, Hotelling's  $T^2$  statistic, Roy union-intersection principle, principal components, canonical analysis, factor analysis. Not open to students who have taken the former Mathematics 242. Prerequisite: Statistics 244 or equivalent. C-L: Mathematics 218. One course. *Burdick*

**253. Applied Stochastic Processes. (QR)** Not open to students who have taken Mathematics 240. Prerequisite: Mathematics 135 or equivalent. See C-L: Mathematics 216. One course. *Staff*

**273. Numerical Analysis. (QR)** Prerequisites: knowledge of an algorithmic programming language, intermediate calculus including some differential equations, and Mathematics 104. See C-L: Computer Science 250; also C-L: Mathematics 221. One course. *Rose or Sun*

**290. Statistical Laboratory. (QR)** Introduction to statistical thinking, data management and collection, sampling and design, exploratory data analysis, graphical and tabular displays,

summarizing data. Introduction to applied work. Computer orientation, statistical packages and operating systems, especially unix on high-speed workstations, and the statistical package S-Plus. Graphics and numerical computing. Examples from various disciplines. One course. *Staff*

**293. Special Topics in Statistics. (QR)** Advanced topics of current interest. Prerequisite: Statistics 213 or consent of instructor. One course. *Staff*

**294. Special Topics in Statistics. (QR)** Prerequisite: Statistics 213 or consent of instructor. One course. *Staff*

**297. Topics in Probability Theory. (QR)** Prerequisite: Mathematics 287 or consent of instructor. See C-L: Mathematics 288. One course. *Staff*

## **COURSES CURRENTLY UNSCHEDULED**

**30. Introduction to Decision Analysis. (QR)**

**31. Applied Game Theory. (QR)**

**104S. Probability. (QR)**

**115. Statistical Data Analysis in Engineering. (QR)**

**203S. Senior Seminar in Statistics. (QR)**

**246. Experimental Design. (QR)**

**282. Optimization Methods. (QR)**

## **Swahili**

For courses in Swahili see Asian and African Languages and Literature.

## **University Writing Program**

Professor of the Practice Gopen, *Director of the Writing Across the University Program*; Lecturer Russell, *Assistant to the Director of the Writing Across the University Program*; Assistant Professor of the Practice Hillard, *Director of the First-year Writing Program*; Lecturer Smith, *Assistant Director of the First-Year Writing Program*; Assistant Professor of the Practice Brett; Lecturer Askounis; Senior Lecturing Fellows DiPietro and Kellogg

The first-year writing requirement may be fulfilled by successfully completing University Writing Course 4, 5, 6, 7, or 8, each of which involves expository composition and regular individual conferences. The requirement must be fulfilled in a student's first semester of residence at Duke. Despite the distinction in course titles, all these courses deal with the same core concerns and have the same objective: they are intended to help students of all abilities to a greater understanding of the language and thereby to a greater control of their thinking process.

The University Writing Program also coordinates a series of courses offered in several departments in which writing is a key component of learning. In 1997 these include the 20S-series courses in cultural anthropology, English, history, literature, music, political science, and religion.

**4. Workshop in Rhetoric (4).** A collaborative workshop that attends to the complexities of the communication process between writers and readers. Designed for those who feel less confident than they would like about their writing. One course. *Staff*

**5. Workshop in Rhetoric (5).** Like University Writing Course 4, this course is a collaborative workshop that attends to the complexities of the communication process between writers and readers. Designed for those who feel relatively confident about their writing. One course. *Staff*

**7. Workshop in Rhetoric (7): The FOCUS Program.** A collaborative workshop that attends to the complexities of the communication process between writers and readers. Designed to coordinate with the subject matter of the various FOCUS Programs. One course. *Staff*

**8. Workshop in Rhetoric (8).** This course, which covers the rhetorical principles available in University Writing Course 4, 5, 6, and 7, is offered only in the spring. Not open to students who have passed 4, 5, 6, or 7. One course. *Staff*

**12. Intermediate Composition.** For transfer students and continuing education students only. The approach to evaluating written language that is taught in the University Writing Program. Not open to students who have taken University Writing Course 4, 5, 6, 7, or 8. One course. *Staff*

**112S. Scientific Writing.** Advanced composition for those who will be choosing careers in science. Techniques for presenting complicated data and complex thought in clear and persuasive prose. Readings in the history, philosophy, or theory of science. Weekly writing tasks. Prerequisite: University Writing Course 4, 5, 6, 7, or 12. C-L: English 116A. One course. *Staff*

**117S. Advanced Composition I.** Emphasis on the connections between substance and structure; revision techniques and inventional procedures. Tailored to the level, needs, and interests of students who enroll. Prerequisite: previous University Writing Course or consent of the director of the Writing Across the University Program. C-L: English 117A. One course. *Staff*

**118S. Advanced Composition II.** Emphasis on preparing prose for publication, in whatever fields interest the participating students. Prerequisite: successful completion of University Writing Course 117S. C-L: English 117B. One course. *Staff*

## **COURSES CURRENTLY UNSCHEDULED**

**3. Introductory Composition and Rhetoric.**

**6. Interpretive Writing.**

## **Women's Studies (WST)**

Professor of the Practice J. O'Barr, *Director*; Assistant Professor of the Practice Rudy; Research Professor Giddings. *Affiliated faculty*: Professor Hewitt (history); Associate Professors Fulkerson (divinity) and Sieburth (romance studies); Assistant Professor of the Practice Curtis (political science); Adjunct Professor White; Visiting Assistant Professor Armstrong

A major or minor is available in this program.

The Program in Women's Studies provides for students an understanding of the forces that shape the position of women and men in society and develops an appreciation for knowledge about gender. Women's studies brings together faculty and students from across the university who are encouraged to question and reinterpret existing bodies of knowledge and to include women's perspectives and contributions in this critical approach.

The courses listed below are offered by the Women's Studies Program (WST) or by other academic departments and programs. For a more detailed description of each course, contact the Women's Studies Program Office or the appropriate department or program office.

## **REGULARLY SCHEDULED COURSES IN WOMEN'S STUDIES**

### **Women's Studies Core Courses (WST)**

**60. Gender, Social Policy, and Politics. (SS)** A study of the social context of gender roles and the varying political perspectives used to analyze them. Emphasis on contemporary issues and proposed policy solutions to them. One course. *Staff*



**103. An Introduction to Women's Studies. (SS)** A course about women, gender, and feminist theories in the United States, using a variety of disciplinary approaches to analyze women's experiences, the women's movement, and women's studies. One course. *J. O'Barr and staff*

**108. AIDS: Ethics, Policy, and Representation. (SS)** An interdisciplinary approach to the study of AIDS that investigates health, gender, and sexuality, policy decisions, and ethical problems related to the illness and its impact on society. C-L: Public Policy Studies 108 and Study of Sexualities. One course. *Rudy*

**117. Black Women and the Civil Rights Movement. (SS)** See C-L: African and African-American Studies 117. One course. *Giddings*

**150. Selected Topics in Women's Studies.** Topics vary, focusing on interdisciplinary work arising from feminist scholarship. One course. *Staff*

**150S. Selected Topics in Women's Studies.** Seminar version of Women's Studies 150. One course. *Staff*

**191, 192. Independent Study.** Directed reading and/or research resulting in a substantive paper or report containing significant analyses and interpretation on a Women's Studies related topic. Open only to juniors with consent of instructor and program director. One course each. *Staff*

**193, 194. Independent Study.** Directed reading and/or research resulting in a substantive paper or report containing significant analyses and interpretation on a Women's Studies related topic. Open only to seniors. Consent of instructor and program director required. One course each. *Staff*

**195S. Senior Seminar in Women's Studies.** Original research project in feminist scholarship, applying multidisciplinary perspectives. For Women's Studies Program majors and minors. Consent of instructor required. One course. *Staff*

## **Women's Studies Courses Across Disciplines**

### **African and African-American Studies**

90S. Considering Identity Using Fiction and Ethnography. (Cross-listed.) *Daniels*

115A. History of Africa: From Antiquity to Early Modern Times. (Cross-listed.) *El Hamel or Ewald*

115B. History of Africa: From Early Modern Times to Independence. (Cross-listed.) *El Hamel or Ewald*

117. Black Women and the Civil Rights Movement. (Cross-listed.) *Giddings*

160. Women in Islam: Fact and Fiction. (Cross-listed.) *Cooke*

216S. Gender, Race, and Class. (Cross-listed.) *Luttrell*

### **Art History**

167. Twentieth-Century Art, 1900-1945: The Avant-garde and Modernism. (Cross-listed.) *Stiles*

168. Art since 1945: Modernism and Postmodernism. (Cross-listed.) *Stiles*

179. The History of Performance Art. (Cross-listed.) *Stiles*

187. Surrealism. (Cross-listed.) *Stiles*

### **Asian and African Languages and Literature**

188. The Politics of Women's Liberation in the Arab World. *Staff*

190. Women in Islam: Fact and Fiction. (Cross-listed.) *Cooke*

### **Classical Studies**

104S. Women in the Ancient World. (Cross-listed.) *Boatwright*

### **Cultural Anthropology**

90S. Considering Identity Using Fiction and Ethnography. (Cross-listed.) *Daniels*

103. Sexuality and Culture in America. (Cross-listed.) *Luttrell*

110. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*

113. Gender and Culture. (Cross-listed.) *Allison, Luttrell, Quinn, or Silverblatt*

115S. The Anthropology of Gender: Special Topics. *Allison, Luttrell, Quinn, Silverblatt, or Starn*

- 126. Muslim World: Transformations and Continuities. (Cross-listed.) *Ewing*
- 137. Gender Inequality. (Cross-listed.) *Allison, Luttrell, Quinn, or Silverblatt*
- 141. Self and Society. (Cross-listed.) *Apte, Ewing, or Luttrell*
- 142. Sexuality in Global Perspective. (Cross-listed.) *Luttrell*
- 174. Gender and Language. (Cross-listed.) *Andrews*
- 191A. S. Feminist Ethnography. (Cross-listed.) *Luttrell*
- 199E. S. Colonialism, Ethnicity, and Gender in Postrevolutionary Bolivia. (Cross-listed.) *Staff*
- 215S. The Anthropology of Gender: Theoretical Issues. *Allison, Luttrell, Quinn, Silverblatt, or Starn*
- 216S. Gender, Race, and Class. (Cross-listed.) *Luttrell*

#### Drama

- 107S. Twentieth-Century Women Playwrights. *McAuliffe*
- 179. The History of Performance Art. (Cross-listed.) *Stiles*

#### English

- 115. Gender and Language. (Cross-listed.) *Andrews*
- 120. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*
- 269. American Women Writers. *C. Davidson, Pope, or Tompkins*

#### French

- 147. Seventeenth-Century Fictions of Women. *Longino*
- 159. Topics in Sexuality and Gender Studies. *Staff*

#### German

- 137S. Introduction to Twentieth-Century German Women Writers. *Rasmussen*
- 254S. Literature by Women. *Rasmussen*

#### History

- 115A. History of Africa: From Antiquity to Early Modern Times. (Cross-listed.) *El Hamel or Ewald*
- 115B. History of Africa: From Early Modern Times to Independence. (Cross-listed.) *El Hamel or Ewald*
- 117. Early Modern Europe. (Cross-listed.) *Neuschel*
- 126S. Women in the Ancient World. (Cross-listed.) *Boatwright*
- 160. The United States from the New Deal to the Present. *Chafe*
- 169A. American Women, 1600-1877. (Cross-listed.) *Hewitt*
- 169B. American Women, 1877 to the Present. (Cross-listed.) *Hewitt*
- 171A. History of Women in Early Modern Europe. (Cross-listed.) *Neuschel*
- 190. The History of Women in Science and Medicine. *Green*

#### Italian

- 115. Italian Women Writers. (Cross-listed.) *Finucci*
- 159S. Topics in Sexuality and Gender Studies. (Cross-listed.) *Finucci or staff*

#### Literature

- 114. Film Theory. (Cross-listed.) *Gaines*
- 121. Special Topics in Women in Literature. *Staff*
- 123. Special Topics in Women Writers. *Staff*
- 125. Special Topics in Gender and Sexuality. *Staff*
- 214. Gender, Nationalities, and Russian Literary Traditions. (Cross-listed.) *Gheith*

#### Philosophy

- 122. Philosophical Issues in Feminism. *Staff*
- 203S. Contemporary Ethical Theories. (Cross-listed.) *Flanagan, Golding, or MacIntyre*

#### Political Science

- 140. Feminist Theory (C-N). *Curtis*
- 289S. Contemporary Ethical Theories (C-N). (Cross-listed.) *Flanagan, Golding, or MacIntyre*

#### Psychology

- 106. The Psychology of Women (P). *Fischer, Hamilton, or Roth*
- 113A. Self and Society (P). (Cross-listed.) *Apte, Ewing, or Luttrell*
- 116. Social Psychology (P). (Cross-listed.) *Costanzo, Fischer, George, or staff*
- 150S. Hormones and Behavior (B, P). *C. Williams*
- 180S. Advanced Topics in the Psychology of Gender (P). *Fischer, Hamilton, or Roth*
- 217S. Advanced Social Psychology (P). *Costanzo or Fischer*
- 264S. Gender, Hormones, and Health (P). (Cross-listed.) *Hamilton*

## Public Policy Studies

108. AIDS: Ethics, Policy, and Representation. (Cross-listed.) *Rudy*  
140. Women as Leaders. *Staff*

## Religion

40. Judaism. (Cross-listed.) *Staff*  
109. Women in the Biblical Tradition: Image and Role. (Cross-listed.) *C. Meyers*  
119. Muslim World: Transformations and Continuities. (Cross-listed.) *Ewing*  
125. Women and Sexuality in the Christian Tradition. (Cross-listed.) *Clark*  
138. Women and Religion in America. (Cross-listed.) *Joyce*  
139. Women in Islam: Fact and Fiction. (Cross-listed.) *Cooke*  
234. Early Christian Asceticism. *Clark*  
253. Feminist Theory and the Study of Christianity. *Clark and McClintock-Fulkerson*  
262. Special Topics in Gender and Religion. (Cross-listed.) *Joyce*

## Russian

159. Women's Autobiographies in European Contexts: Telling the Self in Russia, France, and Britain. (Cross-listed.) *Gheith*  
174. Gender and Language. (Cross-listed.) *Andrews*  
214. Gender, Nationalities, and Russian Literary Traditions. (Cross-listed.) *Gheith*  
269. Women and Russian Literature. (Cross-listed.) *Gheith*

## Sociology

103. Sexuality and Culture in America. (Cross-listed.) *Luttrell*  
106. Social Psychology. (Cross-listed.) *Costanzo, Fischer, George, or staff*  
111. Social Inequality: An International Perspective. *DiPrete or O'Rand*  
118. Sex, Gender, and Society. (Cross-listed.) *Buchmann or O'Rand*  
149. Sexuality and Society. (Cross-listed.) *Bach or Tiryakian*  
150. The Changing American Family. *Simpson*  
155. Organizations and Management. (Cross-listed.) *DiPrete, Thornton, or Zhou*  
160. Advertising and Society: Global Perspective. (Cross-listed.) *Luttrell, O'Barr, or Wilson*  
161. Adulthood and Aging. *George, Gold, or O'Rand*  
165. Occupations, Professions, and Careers. *O'Rand, Simpson, or Spenner*  
188B. S. Colonialism, Ethnicity, and Gender in Postrevolutionary Bolivia. (Cross-listed.) *Staff*

## Spanish

- 132B. S. Colonialism, Ethnicity, and Gender in Postrevolutionary Bolivia. (Cross-listed.) *Staff*  
147S. Latin-American Women Writers. (Cross-listed.) *Staff*  
177S. Women Writers of Spain. *Vilarós or staff*

## Recommended Course Offerings

The courses listed below are recommended by the Women's Studies Program as complementary and relevant.

### Art History

167. Twentieth-Century Art, 1900-1945: The Avant-garde and Modernism. *Stiles*  
168. Art since 1945: Modernism and Postmodernism. *Stiles*  
179. The History of Performance Art. *Stiles*  
187. Surrealism. *Stiles*

### Cultural Anthropology

110. Advertising and Society: Global Perspectives. *Luttrell, O'Barr, or Wilson*

### Economics

- 208S. Economics of the Family *McElroy*

### English

156. History of Mass Culture in the United States. *Gaines, Radway, Tompkins, Torgovnick, or Willis*  
179S. Repairing the Continent. *A. Davidson*  
189S. Sexualities in Film and Literature. *Clum, Gaines, or Moses*

### History

- 107A. Tudor/Stuart Britain. *Herrup*  
107B. Modern Britain. *Thorne*  
115A. History of Africa: From Antiquity to Early Modern Times. *El Hamel or Ewald*  
115B. History of Africa: From Early Modern Times to Independence. *El Hamel or Ewald*

117. Early Modern Europe. *Neuschel*  
160. The United States from the New Deal to the present. *Chafe*

#### Literature

114. Film Theory. *Gaines*

#### Psychology

- 113A. Self and Society. *Apte, Ewing, or Luttrell*

#### Religion

40. Judaism. *Staff*  
234. Early Christian Asceticism. *Clark*

#### Sociology

106. Social Psychology. *Costanzo, Fischer, George, or staff*  
111. Social Inequality: An International Perspective. *DiPrete or O'Rand*  
150. The Changing American Family. *Simpson*  
155. Organizations and Management. *DiPrete, Thornton, or Zhou*  
161. Adulthood and Aging. *George, Gold, or O'Rand*  
163. Aging and Health. *George or Gold*  
165. Occupations, Professions, and Careers. *O'Rand, Simpson, or Spenner*

**House Courses.** The Women's Studies Program regularly sponsors house courses on topics of interest to students in the program. While house courses do not officially count toward the major or the minor, students are strongly encouraged to consider them as valuable supplements to full-credit courses. Lists of the house courses being offered are available in the program office at the beginning of each semester.

## THE MAJOR

To major in women's studies, a student must take a minimum of ten courses. Introduction to Women's Studies (WST 103) and a senior seminar (WST 195S) or their equivalents are required for the major. Additionally, in order to place the study of women, gender, and feminist theories in a global context, students must choose, in consultation with their advisors, at least one course that focuses primarily on a non-United States and nonwestern European topic or culture. Such courses may include modern and/or historical perspectives on a single culture or number of cultures.

At least seven of these courses must come from courses listed in women's studies either designated as WST or cross-listed with other departments. Up to three courses may be in the following forms: (1) courses from the Recommended Course Offerings list, (2) independent studies, or (3) one-time course offerings not appearing on regular lists, but which are complementary and relevant to a student's course of study. Such courses must be approved by a program advisor in order to be credited toward the major.

As an interdisciplinary major, the women's studies major is organized around a set of guidelines rather than a sequence of required courses. The guidelines are designed to facilitate three distinct yet overlapping levels of inquiry into women's experiences and gender analysis: critique, comparison, and connection. Within the requirements for the major, a student has a great deal of flexibility in designing the substantive focus of the major. To fulfill the major, students must take at least two courses that focus on critique, two that are primarily comparative in nature, and two that emphasize connection. Additional courses may fall under any of these guidelines.

Acquiring critical perspectives is a process involving three steps. The first is to produce new knowledge. In the light of that new knowledge, the second step is to modify the frameworks of knowledge that already exist. The third step is to correct assumptions and biases that prove to be incorrect in the light of this more complete knowledge. Critical perspectives are honed in the women's studies major through courses which emphasize the historical omissions, factual errors, and misrepresentations of women's experiences.

Comparative perspectives are pursued in at least two ways: within and across disciplines and within and across cultures. By comparing how feminist analysis operates in



two or more disciplines, students will be able to identify and analyze the ways in which the methods of academic inquiry differ by discipline and what makes an analysis feminist. By comparing cultural contexts, students will be able to identify and analyze women's and men's diverse experiences.

The emphasis on connections is one of the distinguishing features of the women's studies major. Students are continually encouraged to make connections between ideas and experiences, between past knowledge and future possibilities, between cultural and policy issues and personal decisions, and between women's studies and other academic study. These connections are fostered in senior seminars and independent studies, and through internships or other supervised practice, among other possibilities.

Individual courses will often fulfill more than one of these guidelines. Students will be expected to articulate the ways in which an individual course and particular configurations of courses have facilitated their pursuit of critique, comparison, and connection. Students are thus responsible for designing their own major in close consultation with program advisors. This allows students to explore the topics which most interest them; the flexible nature of the curricular requirements also enables students to take advantage of the onetime course offerings and visiting scholars in constructing personalized programs.

In planning the major, each student works with a faculty advisor to accomplish three goals. The first is to develop a coherent plan of study through which the student pursues a theme or concentration within coursework; that theme or concentration may emphasize breadth or depth in subject matter. The second is to insure that a student balances introductory and advanced courses as they are available from other departments. The third is to fulfill the three guidelines of critique, comparison, and connection described above.

### **Advising**

Each year, several faculty affiliated with the women's studies program serve as advisors for students majoring in women's studies. Majors are paired with faculty advisors on the basis of students' general areas of interest. Students majoring in women's studies are encouraged to seek out and work with any of the women's studies faculty in addition to their primary faculty advisor.

### **Graduation with Distinction**

Qualified students earning a major may be eligible for graduation with distinction in women's studies. More detailed guidelines are available in the program office. Students interested in being considered for distinction should contact the program office no later than the spring of their junior year.

### **THE MINOR**

*Requirements.* The requirements for the minor reflect the ideas shaping the major. A student must complete five courses, including Women's Studies 103 or its equivalent. The four additional courses must come from courses listed in Women's Studies, at least two of which must be at the 100 level. At least one course must be a 100-level seminar. Following the same guidelines of critique, comparison, and connection, students must take at least one course that focuses on critique, one that is comparative nature, and one that emphasizes connection.

In addition to offering courses, and a major and minor representing a focus in women's studies, the program sponsors lectures, films, discussions, conferences, internships, and work-study opportunities. Additional information on courses, the women's studies major or minor, and other opportunities in women's studies is available at the Women's Studies Program Office, 210 East Duke Building.

## Writing

See University Writing Program.

## Zoology (ZOO)

Professor Rausher, *Chair*; Lecturer Grunwald, *Associate Director of Undergraduate Studies in Biology*; Professors Barber, Brandon, Forward, Gillham, Laurie, Livingstone, McClay, Nicklas, H. Nijhout, Simons, Staddon, Terborgh, Tucker, Uyenoyama, and Vogel; Associate Professors Nowicki, Rittschof, Roth, K. Smith, and Van Schaik; Assistant Professors Alberts, Crenshaw, Crowder, Cunningham, Fehon, McShea, Morris, and Wilson; Professors Emeriti Bailey, Bookhout, Fluke, Gregg, Kolpfer, Schmidt-Nielsen, Wainwright and Ward; Associate Professor of the Practice Motten; Assistant Professor of the Practice Mercer; Assistant Research Professors Einstein, Roach, and Smyth; Adjunct Professor Schmidt-Koenig; Adjunct Associate Professor M. Nijhout; Lecturer Lincoln

See Biology for a description of the major and the list of courses taught by the zoology faculty.

## School of Engineering

Professor Dowell, *Dean*; Professor Shepard, *Associate Dean*

### ENGINEERING

#### (INTERDEPARTMENTAL) (EGR)

**21. Energy Technology and the Environment.** Energy production and use has had an increasing impact on the global environment, especially via a concomitant increase in the level of carbon dioxide in the atmosphere. Both new and traditional energy technologies will be analyzed, together with projected environmental impacts of these technologies. Open only to first- or second-year engineering majors, or all nonengineering majors. One course. *Cocks*

**24L. Introduction to Environmental Engineering.** Materials and energy balances applied to environmental engineering problems. Water pollution control, applied ecology, air quality management, solid and hazardous waste control. Environmental ethics. Prerequisite: Chemistry 11L. One course. *Vesilind*

**25L. Introduction to Structural Engineering.** An introduction to engineering and the engineering method through a wide variety of historical and modern case studies, ranging from unique structures like bridges to mass produced objects like pencils. One course. *Petroski*

**49S. First-Year Seminar.** Topics vary each semester offered. One course. *Staff*

**50. Introduction to Numerical Computing.** Introduction to the use of computers in the solution of engineering and scientific problems. Systematic methods for algorithm development and coding in a higher-level computer language. Application of selected numerical methods. Not open to students who have matriculated at Duke. One course. *Staff*

**53L. Computational Methods in Engineering.** Introduction to computer methods and algorithms for analysis and solution of engineering problems using numerical methods in a workstation environment. Topics include; numerical integration, roots of equations, simultaneous equation solving, finite difference methods, matrix analysis, linear programming, dynamic programming, and heuristic solutions used in engineering practice. This course includes instruction in the C programming language and does not require any prior knowledge of computer programming. One course. *Staff*

**54L. Simulations in JAVA.** Development of interactive computer simulations in JAVA using Reality.java, a library that includes graphical objects such as spaceships, planets, and standardized functions for Newtonian mechanics. Introduction to object-oriented programming, linked and inherited structures, and aspects of computational mathematics such as stability and computational error, orbital mechanics, collision detection, strategy, etc. Prerequisite: Engineering 53L or Computer Science 6 or Computer Science 100E. One course. *Stetten*

**75L. Mechanics of Solids.** Analysis of force systems and their equilibria as applied to engineering systems. Stresses and strains in deformable bodies; mechanical behavior of materials; applications of principles to static problems of beams, torsion members, and columns. Selected laboratory work. Prerequisites: Mathematics 32 and Physics 51L. One course. *Gavin, Hueckel, Laursen, Nadeau, B. Ütku, or J. F. Wilson*

**83L. Structure and Properties of Solids.** Introduction to materials science and engineering, emphasizing the relationships between the structure of a solid and its properties. Atomic and molecular origins of electrical, mechanical, and chemical behavior are treated in some detail for metals, alloys, polymers, ceramics, glasses, and composite materials. Prerequisites: Chemistry 11L and Mathematics 31 or 33. One course. *Cocks, Eom, Gösele, Jones, Needham, or Tan*

**108S. Professional Ethics.** Case study approach used to introduce professional ethics. Topics include moral development, confidentiality, risk and safety, social responsibility, fraud and malpractice, legal aspects of professionalism, and environmental ethics. The capstone course for students completing the certificate in the Program in Science, Technology, and Human Values. C-L: Science, Technology and Human Values 108S. One course. *Vesilind*

**115. Engineering Systems Optimization.** Introduction to mathematical optimization, engineering economic analysis, and other decision analysis tools used to evaluate and design engineering systems. Application of linear and nonlinear programming, dynamic programming, expert systems, simulation and heuristic methods to engineering systems design problems. Applications discussed include: production plant scheduling, water resources planning, design and analysis, vehicle routing, resource allocation, repair and rehabilitation scheduling and economic analysis of engineering design alternatives. Corequisite: Mathematics 111. One course. *Peirce*

**123L. Dynamics.** Principles of dynamics of particles, rigid bodies, and selected nonrigid systems with emphasis on engineering applications. Kinematic and kinetic analysis of structural and machine elements in a plane and in space using graphical, computer, and analytical vector techniques. Absolute and relative motion analysis. Work-energy; impact and impulse-momentum. Laboratory experiments. Prerequisites: Engineering 75L and Mathematics 103 or consent of instructor. One course. *Knight, Virgin, or Wright*

**150L. Engineering Communication.** Principles of written and verbal technical communication; graphics, mapping, surveying and engineering drawing. Computer graphics, two- and three-dimensional transformations, hidden-surface and hidden-line algorithms, and computer aided design. Prerequisite: Engineering 53L or equivalent. One course. *Vesilind*

**165. Special Topics in Engineering.** Study arranged on special engineering topics in which the faculty have particular interest and competence as a result of research or professional activities. Consent of instructor(s) required. Quarter course, half course, or one course. Variable credit. *Staff*

**171. Total Quality Systems.** An interdisciplinary approach to principles and practice in the applications of total quality concepts to engineering operations and business managements;



practice in using tools of statistical process control; practice in using quality tools of management and operations; principles of continuous quality improvement; definitions and applications of Total Quality Management (TQM); case studies; personal effectiveness habits and social styles; assignments and projects in team building using tools learned, communication; group problem solving; practice in professional verbal and written technical communications. Prerequisites: junior or senior standing. One course. *Staff*

**175. Aesthetics, Design, and Culture.** An examination of the role of aesthetics, both as a goal and as a tool, in a culture which is increasingly dependent on technology. Visual thinking, perceptual awareness, experiential learning, conceptual modeling, and design will be explored in terms of changes in sensory environment. Design problems will be formulated and analyzed through individual and group design projects. One course. *Pearsall*

**183, 184. Projects in Engineering.** Courses in which engineering projects of an interdisciplinary nature are undertaken. The projects must have engineering relevance in the sense of undertaking to meet human need through a disciplined approach under the guidance of a member of the engineering faculty. Consent of instructor required. One course each. *Staff*

**221. Computational Linear Algebra.** Linear vector spaces of real and complex  $n$ -tuples, norms, metrics, inner-products, basis vectors, rank and dimensionality; matrices as linear maps, rank and nullity; particular and general solutions of  $Ax=b$ ; factorization of matrices by successive transformations; solution of  $Ax=b$  by direct and iterative methods; special and general eigenvalue problems; diagonalization and tridiagonalization by similarity transformations; power methods; and computational complexities, storage requirements, convergence characteristics, error propagation, and the mathematical basis of the studied algorithms. Prerequisites: Mathematics 111 or equivalent, and knowledge of any algorithmic programming language. One course. *S. Utku*

## COURSES CURRENTLY UNSCHEDULED

**23. Principles and Practices in Engineering Economics.**

**135. Continuum Mechanics.**

**151. Computer Simulations in Engineering.**

**170. Forecasting Techniques.**

**172A. Contemporary Science: Issues and Challenges.**

**172B. Contemporary Technology: Issues and Challenges.**

**174. Technology Assessment and Social Choice.**

**187. History of Nuclear Energy: Civilian Applications.**

**188. History of Nuclear Energy: Military Applications.**

**222. Computer Solutions of Ordinary and Partial Differential Equations.**

## Biomedical Engineering (BME)

Professor Barr, *Chair*; Associate Professor, *Director of Undergraduate Studies*; Professors Anderson, Floyd, Hammond, Hochmuth, Jaszczak, Johnson, Katz, McElhaney, Nolte, S. Smith, Strohbehn, von Ramm, and Wolbarsht; Associate Professors Burdick, Glower, Massoud, Myers, Needham, Reichert, and Trahey; Assistant Professors Chilkoti, Collins, Guilak, Henriquez, Krassowska, Setton, Vaslef, Wolf, and Yuan; Professors Emeriti Clark and Plonsey; Associate Research Professor Lindner; Assistant Research Professors Barber, Bohs, Frey, Gauthier, Hales, Henderson, Lobach, Oliver, Owen, K. Nightingale, R. Nightingale, M. Smith, and Stetten; Adjunct Professors Ideker, Neuman, and W. Smith; Adjunct Associate Professors Cooper and Loeb; Adjunct Assistant Professors Black and Cartee

A major is available in this department. The biomedical engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.



Biomedical engineering is the discipline in which the physical, mathematical, and engineering sciences and associated technology are applied to biology and medicine. Contributions range from computer modeling and simulation of physiological systems through development of medical instrumentation and experimental research to solutions of practical clinical problems. The goal of the Biomedical Engineering program is to prepare students for professional employment, for graduate work in engineering, or for entrance into medical school. To achieve this goal, the program is flexible so that electives can be chosen to meet the respective requirements of the direction chosen by the student.

The undergraduate and graduate programs are complemented by the wide range of ongoing research activities within the department. Biomedical engineering in cardiac electrophysiology involves the use of large-scale computer modeling, scientific visualization, and experimental data acquisition of electrical activity of the heart and heart tissue, to increase basic understanding of normal and abnormal behavior. Other projects involve the study of the effects of externally applied electric fields and radio frequency energy on activity in excitable tissue. Design experience is developed and integrated throughout the curriculum and includes a capstone design course, BME 164. Many students gain valuable design experience in the course of independent student projects within the research laboratories and programs of the BME department.

The ultrasound imaging and transducer laboratories are directed toward new signal and image processing techniques, new system architecture and transducer designs to develop novel imaging methods and improve image quality and spatial resolution. The laboratories are equipped with a variety of state-of-the-art ultrasound imaging instruments, electronics and transducer fabrication tools, acoustic and transducer modeling software as well as video and display hardware.

The medical imaging group studies the physics of various modalities including x-ray, SPECT and MRI and develops new computer-aided methods for processing, enhancing, and analyzing images.

The biomechanics laboratories use advanced experimental test facilities, data acquisition technologies, computer simulations and theoretical modeling in the study of cells, tissues, and biological structures. The mechanisms of injury, aging, degeneration, and mechanical signal transduction are studied in a variety of biological systems, including biological fluids, the cervical and lumbar spines, diarthrodial joints, and the heart.

Cell and biosurface engineering is concerned with the regulation of the external and internal cellular environment of the cell for control of biosynthesis and degradation activities, as well as determination of the factors responsible for differentiation of cells into tissues with varying functional requirements. The groups in this program investigate biomaterials, material property characterizations, surface modifications, cell cultures, and the mechanics of biofluids, tissues, and cells. Applications include the development of novel biosensors and micro/nanocarrier drug delivery systems, new techniques for enhanced biological transport, and improved techniques for stimulated repair or inhibited degradation of biological tissues.

Work in medical informatics focuses on the creation and dissemination of health care data and related knowledge. Areas of investigation include networking, database structures, query languages, workstation design and the development of data interchange standards.

Instruction in all these areas is offered at the undergraduate as well as graduate and postdoctoral levels, and opportunities for undergraduate student research are available in most of the biomedical engineering laboratories.

**7. Membranes.** An introduction to the elementary properties of membranes, both electrical and mechanical from a mathematical perspective, with some computer exercises. Prerequisite: limited to freshmen who are prospective biomedical engineering majors. One course. *Barr or Henriquez*

**8. Biomedical Device Design.** An introduction to the origin and characteristics of biologic signals and the features of biomedical systems and devices, from sensor to display/output.

Concepts of analog vs. discrete signals, simple detection schemes, sampling, data reduction, filtering, visualization, and imaging techniques are presented. The course emphasizes team project and system design. Prerequisite: Engineering 053L or equivalent; limited to freshmen. One course. *Henriquez*

**83L. Introduction to Biomaterials.** The principles of materials science and engineering with particular attention to topics most relevant to biomedical engineering. The structure-property relationships of metals, ceramics, polymers, and composites as well as skin, bone, cartilage, ligament, and vasculature; extensive treatment of the properties unique to materials' surfaces. Behavior of materials in the physiological environment. Prerequisites: Chemistry 11L and 12L; corequisite: Physics 51L. One course. *Chilkoti or Reichert*

**101L. Electrobiolgy.** The electrophysiology of excitable cells from a quantitative perspective. Topics include the ionic basis of action potentials, the Hodgkin-Huxley model, impulse propagation, source-field relationships, and an introduction to functional electrical stimulation. Prerequisites: Biomedical Engineering 163L or Electrical Engineering 62L, and Mathematics 111. One course. *Barr, Henriquez, or Krassowska*

**110L. Introductory Biomechanics.** This course is designed to give students in Biomedical Engineering basic training in statics, dynamics, solid mechanics, and mechanical design with applications to the human body. Areas of focus include the determination of the state of stress and strain, experimental measurement in biomechanical systems, mechanical and biomechanical failure criterion, human tolerance, and injury risk. Prerequisites: Mathematics 32 and Physics 51L. One course. *McElhaney, Myers, or R. Nightingale*

**145. Classical Thermodynamics.** Thermodynamic properties and thermodynamic state. Exchange of heat and work in quasi-equilibrium processes. Chemical and phase equilibria of multicomponent mixtures. Prerequisites: junior standing. One course. *Setton, Truskey, or Yuan*

**155. Safety of Medical Devices.** Engineering analysis of the safety of medical devices such as prosthetic heart valves, silicon breast implants, medical imaging, and cardiac pacemakers. Engineering performance standards and US FDA requirements for clinical trials for selected medical devices such as medical diagnostic ultrasound, surgical lasers, and prosthetic heart valves. Students will prepare a mock application for FDA premarket approval to demonstrate safety of a selected medical device. Prerequisites: sophomore standing; corequisite: Physics 52L or equivalent. One course. *S. Smith*

**163L, 164L. Biomedical Electronics and Measurements.** A study of the basic principles of biomedical electronics and measurements with emphasis on the operational performance and selection of transducers, instruments, and systems for biomedical data acquisition and processing. Selected laboratory work emphasizes the measurements of specific physiological events. Prerequisite: Electrical Engineering 61L. One course each. *S. Smith, Trahey, von Ramm, or Wolf*

**171. Signals and Systems.** Convolution, deconvolution, Fourier series, Fourier transform, sampling, and the Laplace transform. Continuous and discrete formulations with emphasis on computational and simulation aspects and selected biomedical examples. Prerequisites: Electrical Engineering 64 and Mathematics 111 or equivalents. One course. *Krassowska*

**191, 192. Projects in Biomedical Engineering.** For juniors or seniors who express a desire for such work and who have shown aptitude for research in one area of biomedical engineering. Half course to two courses. Variable credit. *Staff*

**193, 194, 195. Projects in Cardiovascular Biomedical Engineering.** Projects in emerging cardiovascular technologies. Primarily for Engineering Research Center fellows who express a desire for and who have shown aptitude for research in emerging cardiovascular technologies. Consent of instructor required. One course each. *Staff*

**201L. Electrophysiology.** The electrophysiology of excitable cells from a quantitative perspective. Topics include the ionic basis of action potentials, the Hodgkin-Huxley model, impulse propagation, source-field relationships, and an introduction to functional electrical stimulation. Students choose a relevant topic area for detailed study and report. Not open to students who have taken Biomedical Engineering 101L or equivalent. 3 units; 4 units with laboratory. One course. *Barr or Henriquez*

**204. Measurement and Control of Cardiac Electrical Events.** Design of biomedical devices for cardiac application based on a review of theoretical and experimental results from cardiac electrophysiology. Evaluation of the underlying cardiac events using computer simulations. Examination of electrodes, amplifiers, pacemakers, and related computer apparatus. Construction of selected examples. Prerequisites: Biomedical Engineering 101L and 163L or equivalents. One course. *Wolf*

**205L. Microprocessors and Digital Instruments.** Design of microcomputer-based devices including both hardware and software considerations of system design. Primary emphasis on hardware aspects, including a progression through initial design, prototype construction in the laboratory, testing of prototypes to locate and correct faults, and final design evaluation. Evaluation includes examination of complexity, reliability, and cost. Design and construction oriented toward biomedical devices or instruments that include dedicated microcomputers, usually operating in real time. Prerequisites: Biomedical Engineering 163L, 164L and Engineering 53L or equivalents. One course. *Hammond*

**207. Transport Phenomena in Biological Systems.** An introduction to the modeling of complex biological systems using principles of transport phenomena and biochemical kinetics. Topics include the conservation of mass and momentum using differential and integral balances; rheology of Newtonian and non-Newtonian fluids; steady and transient diffusion in reacting systems; dimensional analysis; homogeneous versus heterogeneous reaction systems. Biomedical and biotechnological applications are discussed. C-L: Civil Engineering 207 and Mechanical Engineering 207. One course. *Katz, Truskey, or Yuan*

**208. Theoretical and Applied Polymer Science.** See C-L: Mechanical Engineering 211. One course. *Pearsall*

**211. Theoretical Electrophysiology.** Advanced topics on the electrophysiological behavior of nerve and striated muscle. Source-field models for single-fiber and fiber bundles lying in a volume conductor. Forward and inverse models for EMG and ENG. Bidomain model. Model and simulation for stimulation of single-fiber and fiber bundle. Laboratory exercises based on computer simulation, with emphasis on quantitative behavior and design. Readings from original literature. Prerequisite: Biomedical Engineering 101L or 201L or equivalent. One course. *Barr or Krassowska*

**212. Theoretical Electrocardiography.** Electrophysiological behavior of cardiac muscle. Emphasis on quantitative study of cardiac tissue with respect to propagation and the evaluation of sources. Effect of junctions, inhomogeneities, anisotropy, and presence of unbounded extracellular space. Bidomain models. Study of models of arrhythmia, fibrillation, and defibrillation. Electrocardiographic models and forward simulations. Laboratory exercises based on computer simulation, with emphasis on quantitative behavior and design. Readings from original literature. Prerequisite: Biomedical Engineering 101L or 201L or equivalent. One course. *Barr*

**213L. Nonlinear Dynamics in Electrophysiology.** Electrophysiological behavior of excitable membranes and nerve fibers examined with methods of nonlinear dynamics. Phase-plane analysis of excitable membranes. Limit cycles and the oscillatory behavior of membranes. Phase resetting by external stimuli. Critical point theory and its applications to the induction



of rotors in the heart. Theory of control of chaotic systems and stabilizing irregular cardiac rhythms. Initiation of propagation of waves and theory of traveling waves in a nerve fiber. Laboratory exercises based on computer simulations, with emphasis on quantitative behavior and design. Readings from original literature. Prerequisite: Biomedical Engineering 101L or 201L or equivalent. One course. *Krassowska*

**215. Biomedical Materials and Artificial Organs.** Chemical structures, processing methods, evaluation procedures, and regulations for materials used in biomedical applications. Applications include implant materials, components of ex vivo circuits, and cosmetic prostheses. Primary emphasis on polymer-based materials and on optimization of parameters of materials which determine their utility in applications such as artificial kidney membranes and artificial arteries. Prerequisite: Biomedical Engineering 83L, Chemistry 151L or Engineering 83L or consent of instructor. C-L: Mechanical Engineering 215. One course. *Reichert*

**216. Transport Phenomena in Cells and Organs.** Applications of the principles of mass and momentum transport to the analysis of selected processes of biomedical and biotechnological interest. Emphasis on the development and critical analysis of models of the particular transport process. Topics include: reaction-diffusion processes, transport in natural and artificial membranes, dynamics of blood flow, pharmacokinetics, receptor-mediated processes and macromolecular transport, normal and neoplastic tissue. Prerequisite: Biomedical Engineering 207 or equivalent. One course. *Truskey*

**220L. Introduction to Biomolecular Engineering.** Structure of biological macromolecules, recombinant DNA techniques, principles of and techniques to study protein structure-function. Discussion of biomolecular design and engineering from the research literature. Linked laboratory assignments to alter protein structure at the genetic level. Expression, purification, and ligand-binding studies of protein function. Consent of instructor required. One course. *Chilkoti*

**222. Principles of Ultrasound Imaging.** Propagation, reflection, refraction, and diffraction of acoustic waves in biologic media. Topics include geometric optics, physical optics, attenuation, and image quality parameters such as signal-to-noise ratio, dynamic range, and resolution. Emphasis is placed on the design and analysis of medical ultrasound imaging systems. Prerequisites: Mathematics 111 and Physics 52L. One course. *von Ramm*

**228. Laboratory in Cellular and Biosurface Engineering.** Introduction to common experimental and theoretical methodologies in cellular and biosurface engineering. Experiments may include determination of protein and peptide diffusion coefficients in alginate beads, hybridoma cell culture and antibody production, determination of the strength of cell adhesion, characterization of cell adhesion or protein adsorption by total internal reflection fluorescence, and Newtonian and non-Newtonian rheology. Laboratory exercises are supplemented by lectures on experiment design, data analysis, and interpretation. One course. *Truskey*

**229. Tissue Mechanics.** Introduction to conservation laws and thermodynamic principles of continuum mechanics with application to tissues of the musculoskeletal and cardiovascular systems. Constitutive equations for hyperelastic solids and multiphase viscoelastic materials using mixture theory formulation. Emphasis on the application of these constitutive formulations to determination of stress and strain fields in equilibrium and transient deformations of calcified tissues (for example, cortical and trabecular bone), soft tissues (for example, ligament, cartilage, cornea, intervertebral disc, left ventricle, aorta), and biological fluids (for example, mucus, synovial fluid, polymer solutions). Tensor fields and indicial notation. Prerequisites: Biomedical Engineering 110L or Engineering 75L or equivalent, and Mathematics 111 or equivalent. One course. *Setton*



**231. Intermediate Biomechanics.** Biomechanics of hard and soft tissues: nonlinear viscoelastic behavior of tendon and ligament; poroelastic behavior of cartilage and meniscus; continuum modeling of bone. Emphasis will be placed on experimental techniques used to evaluate these tissues. Student seminars on topics in applied biomechanics will be included. Prerequisites: Biomedical Engineering 110L or Engineering 75L or equivalent, and Biomedical Engineering 83L or Engineering 83L or equivalent. One course. *Myers*

**232L. Biomedical Instrumentation.** A study of the basic principles of biomedical electronics and measurements with emphasis on the operational performance and selection of transducers, instruments, and systems for biomedical data acquisition and processing. Selected laboratory work emphasizes the measurement of specific physiologic events. Students will design and build a working medical instrument. Consent of instructor required. Not open to students who have taken Biomedical Engineering 164L. One course. *Wolf*

**233. Modern Diagnostic Imaging Systems.** The underlying concepts and instrumentation of several modern medical imaging modalities. Review of applicable linear systems theory and relevant principles of physics. Modalities studied include X-ray radiography (conventional film-screen imaging and modern electronic imaging), computerized tomography (including the theory of reconstruction), and nuclear magnetic resonance imaging. Prerequisites: junior or senior standing. One course. *Trahey*

**235. Acoustics and Hearing.** The generation and propagation of acoustic (vibrational) waves and their reception and interpretation by the auditory system. Topics under the heading of generation and propagation include free and forced vibrations of discrete and continuous systems, resonance and damping, and the wave equation and solutions. So that students may understand the reception and interpretation of sound, the anatomy and physiology of the mammalian auditory system are presented; and the mechanics of the middle and inner ears are studied. Prerequisites: Mathematics 111 and Physics 52L or equivalents. C-L: Electrical Engineering 284. One course. *Collins or Trahey*

**237. Biosensors.** Biosensors are defined as the use of biospecific recognition mechanisms in the detection of analyte concentration. The basic principles of protein binding with specific reference to enzyme-substrate, lectin-sugar, antibody-antigen, and receptor-transmitting binding. Simple surface diffusion and absorption physics at surfaces with particular attention paid to surface binding phenomena. Optical, electrochemical, gravimetric, and thermal transduction mechanisms which form the basis of the sensor design. Prerequisites: Biomedical Engineering 215 and consent of instructor. One course. *Reichert*

**239. Cell Transport Mechanisms.** Analysis of the migration of cells through aqueous media. Focus on hydrodynamic analysis of the directed self-propulsion of individual cells, use of random walk concepts to model the nondirected propulsion of individual cells, and development of kinetic theories of the migrations of populations of cells. Physical and chemical characteristics of the cells' environments that influence their motion, including rheologic properties and the presence of chemotactic, stimulatory, or inhibitory factors. Cell systems include mammalian sperm migration through the female reproductive tract, protozoa, and bacteria. Emphasis on mathematical theory. Experimental designs and results. Consent of instructor required. One course. *Katz*

**241. Artificial Intelligence in Medicine.** Basic concepts of artificial intelligence (AI) and in-depth examination of medical applications of AI. Knowledge of heuristic programming; brief examination of classic AI programming languages (LISP and PROLOG) and AI programming; rule-based systems and cognitive models. One course. *Hales or Hammond*

**243. Introduction to Medical Informatics.** An introduction to medical informatics: an in-depth study of the use of computers in biomedical applications. Hardware, software, and

applications programming. Data collection, analysis, and presentation studied within application areas such as patient monitoring, computer-based medical records, computer-aided decision making, computer-aided instruction, quality assurance laboratory systems, wave form analysis, hospital information systems, and medical information systems. One course. *Hales or Hammond*

**244. Mathematical Models of Physiological Systems.** Mathematical modeling and computer simulation of physiological and other biomedical systems. Formulation of quantitative models of physiological processes using methods drawn from a variety of engineering disciplines including transport phenomena, feedback control, and continuum mechanics. Digital techniques for the solution of coupled nonlinear equations, emphasizing systems of ordinary and partial differential equations. Selected readings from the literature covering current models of cardiovascular, renal, neural, respiratory, and sensory systems. Prerequisite: Mathematics 111 or equivalent. One course. *Staff*

**246. Computational Methods in Biomedical Engineering.** Introduction to practical computational methods for data analysis and simulation with a major emphasis on implementation. Methods include numerical integration and differentiation, extrapolation, interpolation, splining FFTs, convolution, ODEs, and simple one- and two-dimensional PDEs using finite differencing. Introduction to concepts for optimizing codes on a CRAY-YMP. Examples from biomechanics, electrophysiology, and imaging. Project work included and students must have good working knowledge of Unix, Fortran, or C. Intended for graduate students and seniors who plan on attending graduate school. Prerequisite: Engineering 53L or equivalent, Mathematics 111 or equivalent, or consent of instructor. One course. *Henriquez*

**250. Cardiovascular Mechanics.** Mechanical principles and their applications in the human circulatory system. The coupling of solid and fluid behavior in cardiovascular organs is emphasized. Topics include: gravity and the circulation, kinematics of blood flow and circulatory volume balances, peripheral resistance, wall stresses and deformations, cardiac cycle and cardiac work, circulatory wave propagation, unsteady velocity profiles and boundary layers. Special student projects involve the design of diagnostic and therapeutic instruments and devices for cardiovascular applications. Prerequisites: Biomedical Engineering 110L and Mathematics 111 or equivalent. One course. *Staff*

**260. Devices for the Disabled.** Design of custom devices to aid disabled individuals. Students will be paired with health care professionals at local hospitals who will supervise the development of projects for specific clients. Formal engineering design principles will be emphasized; overview of associative technologies, patent issues, engineering ethics. Oral and written reports will be required. Selected projects may be continued as independent study. Prerequisite: Biomedical Engineering 164L or equivalent or consent of instructor. One course. *Bohs*

**264L. Medical Instrument Design.** General principles of signal acquisition, amplification processing, recording, and display in medical instruments. System design, construction, and evaluation techniques will be emphasized. Methods of real-time signal processing will be reviewed and implemented in the laboratory. Each student will design, construct, and demonstrate a functional medical instrument and collect and analyze data with that instrument. Formal write-ups and presentations of each project will be required. Prerequisites: Biomedical Engineering 164L or equivalent or senior standing. One course. *S. Smith, Trahey, or Wolf*

**265. Advanced Topics in Biomedical Engineering.** Advanced subjects related to programs within biomedical engineering tailored to fit the requirements of a small group. Consent of instructor required. One course. *Staff*

## COURSES CURRENTLY UNSCHEDULED

- 106. Mass and Energy Balances in Chemical and Biological Systems.
- 132. Statistical and Computational Methods in Signal Processing.
- 206L. Microprocessors and Digital Instruments.
- 209. Kinetics and Reactor Design.
- 223. Cellular and Integrative Cardiovascular Physiology and Biophysics.
- 230. Biomechanics.

## THE MAJOR

The major requirements are included in the minimum total of thirty-four courses listed under general requirements and departmental requirements. The following specific courses or their approved alternatives be included: Biomedical Engineering 83L, 101, 110L, 145, 163, 164, 171, and 207.

## Civil and Environmental Engineering (CE)

Professor Petroski, *Chair*; Visiting Professor Rumer, *Director of Undergraduate Studies*; Professors Haff, Melosh, Reckhow, S. Utku, Vesilind, and J. F. Wilson; Associate Professors Hueckel, Kabala, Malin, Medina, Peirce, Rojstaczer, and Virgin; Assistant Professors Ahmann, Boadu, Gavin, Katul, Laursen, and Nadeau; Professor Emeritus Brown; Assistant Research Professor Miller-Hooks; Adjunct Professors Ahearne and McKinney; Adjunct Associate Professors Piver and B. Utku; Visiting Professor Narayanan

A major in civil engineering is available in this department. The civil engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

The infrastructure that makes up what we refer to as civilization is, for the most part, the work of civil and environmental engineers. Improving, or even maintaining, the quality of life is ever more challenging as urban problems in the industrialized nations of the world intensify, while rapid urbanization in many developing countries creates other opportunities and obligations for the civil and environmental engineer. The planning, design, construction, and maintenance of necessary facilities, in an era of increasingly scarce monetary and other resources, demand civil and environmental engineers dedicated to work for the public good and prepared to seek more efficient and effective solutions based on current technology. The challenges faced by civil and environmental engineers vary widely in nature, size, and scope, and encompass both the public and private sectors. Examples include: space structures and launch facilities, hazardous waste disposal facilities, water supply and treatment facilities, power plants, bridges, dams, buildings, tunnels, highways, subways, seaports, airports, and offshore structures.

The mission of the undergraduate program in the Department of Civil and Environmental Engineering at Duke University is to provide an education that prepares graduates to solve technical problems, to pursue life-long learning in their field, to assume leadership roles in their chosen careers, and to recognize their professional and personal obligations to the broader society and culture. The program is designed to provide a holistic educational experience where engineering sciences and design are combined with humanities and social sciences to provide the foundation for the critical thinking and skills that allow graduates to enjoy the benefits of a liberal education.

The goals of the program are to help graduates develop:

- (1) a solid understanding of the engineering sciences and the process of engineering design;
- (2) the ability to think critically;



- (3) the ability to communicate orally, in writing, and mathematically;
- (4) the ability to analyze and understand the social, economic, ethical and environmental implications of their engineering work;
- (5) the ability to work individually, as well as in teams, and manage the work of others; and
- (6) a commitment to life-long learning and professional development.

Students can emphasize any one of the specialty areas in which the faculty is engaged in teaching and research, including: environmental engineering, structural engineering and mechanics, transportation and systems engineering, water resources, and geotechnical engineering. The department also offers a certificate program in architectural engineering. Students may also enroll in the very selective BSE/MBA degree program and after five years of study obtain an engineering degree and an MBA degree from Duke's Fuqua School of Business. In addition, students may pursue a degree in civil engineering coupled with a double major in another department at Duke. Examples of recently completed double majors reflect the breadth of interests shared by civil and environmental engineering students at Duke: public policy studies, economics, French, mathematics, and music.

The civil and environmental engineering program is built upon the expertise and experience of the faculty and is supported by commensurate laboratory and instructional facilities. The civil and environmental engineering professors are committed to providing quality classroom instruction, advising, and laboratory experiences in settings that encourage student-faculty as well as student-student interactions. The faculty conducts research of national and international consequence, and undergraduates have ample opportunities to be involved in such research, through undertaking independent study projects and/or by working as research assistants. The research facilities in the department, including laboratory equipment and instrumentation as well as computer resources, are comparable to those found in other major universities.

Graduates of the Department of Civil and Environmental Engineering are able to select from a wide range of career paths. Recent graduates have pursued advanced study in engineering, business, law, and architecture, while others have accepted positions with major corporations and federal, state, and local government agencies as design engineers and project managers.

**116. Transportation Engineering.** The role and history of transportation. Introduction to the planning and design of multimodal transportation systems. Principles of traffic engineering, route location, and geometric design. Planning studies and economic evaluation. Prerequisites: Statistics 113 and consent of instructor for nonengineering students. One course. *Staff*

**122L. Fluid Mechanics.** Physical properties of fluids; fluid-flow concepts and basic equations; continuity, energy, and momentum principles; dimensional analysis and dynamic similitude; viscous effects; applications emphasizing real fluids. Selected laboratory work. Corequisite: Engineering 123L. One course. *Boadu, Kabala, Laursen, or Medina*

**123L. Water Resources Engineering.** Descriptive and quantitative hydrology, hydraulics of pressure conduits and measurement of flow, compound pipe systems, analysis of flow in pressure distribution systems, open channel flow, reservoirs and distribution system storage. Groundwater hydrology and well-hydraulics. Probability and statistics in water resources. Selected laboratory and field exercises, computer applications. Prerequisite: Civil Engineering 122L. One course. *Kabala or Medina*

**124L. Environmental Engineering.** Physical, chemical, and biological characterization of water and wastewater. Introduction to water treatment processes and wastewater collection, treatment and disposal systems. Air pollution control; solid and hazardous waste engineering. Laboratory included. Field trips to be arranged. Prerequisite: Civil Engineering 122L. One course. *Peirce*



**127. Environmental Pollution Control.** A study of the environmental causes and effects of air, land, and water pollution. Interactions between the environment and stresses to which it is subjected as a consequence of growth and concentration of populations and their increasing demands on natural resources. Solid waste, recycling, noise pollution, and environmental ethics. Not open to engineering majors. One course. *Vesilind*

**131L. Theory of Structures.** Application of the principles of mechanics of deformable bodies to the analysis of plane and space structures: linear analysis by hand and by machine, of statically determinate and indeterminate structures of one-dimensional elements, with the force, displacement, and mixed methods. Prerequisites: Engineering 75L and Mathematics 103. One course. *Gavin or S. Utku*

**133L. Structural Design I.** Nonhomogenous materials. Determination of physical and mechanical properties of construction materials. Theory and design of compression and flexural members. Emphasis on ultimate strength theory for concrete. Timber design using mechanical fasteners. Laboratory exercises include concrete aggregate evaluation, concrete mix design, and structural timber tests. Prerequisite: Engineering 75L. One course. *Narayanan*

**134L. Structural Design II.** Design in metals, primarily steel. Properties of materials as criteria for failure. Tension, compression, and flexural members. Bolted and welded connections, including eccentric connections. Built-up members. Design by elastic and plastic methods. Selected problems to include computations and drawings. Prerequisite: Engineering 75L. One course. *Narayanan*

**139L. Introduction to Soil Mechanics.** Origin and composition of soils, soil structure. Flow of water through soils. Environmental geotechnology: land waste disposal, waste containment, and remediation technologies. Soil behavior under stress; compressibility, shear strength. Elements of mechanics of soil masses with application to problems of bearing capacity of foundations, earth pressure on retaining walls, and stability of slopes. Laboratory included. Prerequisite: Civil Engineering 122L. One course. *Boadu or Hueckel*

**141, 142. Special Topics in Civil Engineering.** Study arranged on a special topic in which the instructor has particular interest and competence. Consent of instructor and director of undergraduate studies required. Half course or one course each. Variable credit. *Staff*

**161. Architectural Engineering I.** Analysis of the building through the study of its subsystems (enclosure, space, structural, environmental-control). Building materials and their principal uses in the enclosure and structural subsystems. Computer aided design. Field trips. Prerequisites: junior or senior standing, consent of instructor for nonengineering students. One course. *B. Utku or staff*

**162. Architectural Engineering II.** Design and integration of building subsystems (enclosure, space, structural, environmental-control) in the design of a medium-sized building. Prerequisite: Civil Engineering 161 or consent of instructor. One course. *B. Utku or staff*

**192. Civil Engineering Design.** Student design teams complete a preliminary design of an actual civil engineering project and present the design to a panel of civil engineering faculty and practitioners. A written technical report is required. Topics to be addressed include: the design process; cost estimation; legal, ethical, and social aspects of professional engineering practice; short-term and long-term design serviceability considerations. Open only to civil engineering students during their final two semesters. One course. *Narayanan and Rumer*

**197, 198. Projects in Civil Engineering.** These courses may be taken by junior and senior engineering students who have demonstrated aptitude for independent work. Consent of

instructor and director of undergraduate studies required. Half course or one course each. Variable credit. *Staff*

**201. Advanced Mechanics of Solids.** Tensor fields and index notation. Analysis of states of stress and strain. Conservation laws and field equations. Constitutive equations for elastic, viscoelastic, and elastic-plastic solids. Formulation and solution of simple problems in elasticity, viscoelasticity, and plasticity. One course. *Hueckel, Laursen, Nadeau, or Petroski*

**203. Plasticity.** Inelastic behavior of soils and engineering materials. Yield criteria. Flow rules. Concepts of perfect plasticity and plastic hardening. Methods of rigid-plasticity. Limit analysis. Isotropic and kinematic hardening. Plastic softening. Diffused damage. Thermo-plasticity. Visco-plasticity. Prerequisite: Civil Engineering 201 or consent of instructor. One course. *Hueckel*

**204. Plates and Shells.** Differential equation and extremum formulations of linear equilibrium problems of Kirchhoffian and non-Kirchhoffian plates of isotropic and anisotropic material. Solution methods. Differential equation formulation of thin anisotropic shell problems in curvilinear coordinates; membrane and bending theories; specialization for shallow shells, shells of revolution, and plates. Extremum formulation of shell problems. Solution methods. Prerequisites: Engineering 75L or 135 and Mathematics 111. One course. *S. Utku*

**207. Transport Phenomena in Biological Systems.** See C-L: Biomedical Engineering 207; also C-L: Mechanical Engineering 207. One course. *Katz, Truskey, or Yuan*

**210. Intermediate Dynamics.** See C-L: Mechanical Engineering 210. One course. *Hall or Knight*

**217. Transportation Systems Analysis.** The transportation systems planning process. Quantitative analysis; mathematical modeling and computer simulation techniques for short- and long-range planning and evaluation of transportation systems. Prerequisite: (or corequisite) Civil Engineering 116 or consent of instructor. One course. *Staff*

**218. Engineering Management and Project Evaluation.** Economics and statistical analysis. Economic impact assessment, supply and demand forecasting, benefit/cost analysis, economic incentives, public and private finance, input/output analysis. Data organization, distributions, estimates of parameters, hypothesis testing, analysis of variance, and experimental design. One course. *Peirce*

**220. Water Resources Systems Planning and Management.** Focus on the development and application of mathematical modeling techniques to water resources systems problems. Deterministic and stochastic river basin modeling, irrigation planning and modeling, water quality prediction and management, wetlands management, the optimal expansion of existing water resources systems and reservoir operations. Emphasis on development and application of optimization models for the planning and management of complex water resources systems involving the interaction of groundwater and surface water resources. Mathematical techniques include linear and dynamic programming, Monte Carlo simulation, simulated annealing, nonlinear optimization and stochastic optimization. Prerequisites: Civil Engineering 123L and Engineering 115 or equivalent. One course. *Staff*

**221. Engineering Systems Reliability, Safety, and Risk Assessment.** Introduction to the concepts of design reliability and safety. Topics include: concepts of probability in engineering planning and design, decision analysis and assessment of reliability, modeling and analysis of uncertainty, reliability-based design, multiple failure mode analysis, redundant and nonredundant systems, and fault tree analysis. Emphasis on determining the probability of failure for numerous engineering systems including structural systems,

infrastructure systems, water treatment systems, environmental systems, and transportation networks. Prerequisite: Mathematics 111 or consent of instructor. One course. *Staff*

**225. Dynamic Engineering Hydrology.** Dynamics of the occurrence, circulation, and distribution of water; climate, hydrometeorology, geophysical fluid motions. Precipitation, surface runoff and stream flow, infiltration, water losses. Hydrograph analysis, catchment characteristics, hydrologic instrumentation, and computer simulation models. Prerequisite: Civil Engineering 122L or consent of instructor. One course. *Medina*

**227. Groundwater Hydrology and Contaminant Transport.** Review of surface hydrology and its interaction with groundwater. The nature of porous media, hydraulic conductivity, and permeability. General hydrodynamic equations of flow in isotropic and anisotropic media. Water quality standards and contaminant transport processes: advective-dispersive equation for solute transport in saturated porous media. Analytical and numerical methods, selected computer applications. Deterministic versus stochastic models. Applications: leachate from sanitary landfills, industrial lagoons and ponds, subsurface wastewater injection, monitoring of groundwater contamination. Conjunctive surface-subsurface models. Prerequisite: Civil Engineering 123L or consent of instructor. One course. *Medina*

**228L. Sludge Management and Disposal.** Production and characterization of residues from wastewater treatment. Theory of solid/water interfaces and vicinal water. Gravitational thickening and dewatering. Anaerobic stabilization, incineration, composting, and other treatment processes. Ultimate disposal. Prerequisites: Civil Engineering 124L or equivalent and consent of instructor. One course. *Vesilind*

**231. Theory of Adaptive Structures.** Behavior of structures composed of one-dimensional members, under inserted internal deformations. Linear excitation-response relations. Energy and power requirements of insertion. Conditions of insertion without structural resistance. Computation of internal deformations yielding a partially prescribed response. Static shape control and slow moving mechanical manipulators. Vibration control by internal deformation insertion in autonomous and nonautonomous systems. Prerequisites: senior or graduate standing. One course. *S. Utku*

**233. Prestressed Concrete Design.** A critical review of research and recent developments in prestressed concrete design. Prestressed tanks, beams, and columns; partial prestressing and composite design. Prerequisite: Civil Engineering 133L or consent of instructor. One course. *Narayanan*

**237. Advanced Soil Mechanics.** Characterization of behavior of geomaterials. Stress-strain incremental laws. Nonlinear elasticity, hypo-elasticity, plasticity and visco-plasticity of geomaterials; approximated laws of soil mechanics; fluid-saturated soil behavior; cyclic behavior of soils; liquefaction and cyclic mobility; elements of soil dynamics; thermal effects on soils. Prerequisite: Civil Engineering 139L or equivalent. One course. *Hueckel*

**240. Fate of Organic Chemicals in the Aquatic Environment.** Kinetic, equilibrium, and analytical approaches applied to quantitative description of processes affecting the fate of anthropogenic and natural organic compounds in surface and groundwaters and in selected treatment processes, including sorption phenomena, gas transfer, hydrolysis, photochemistry, oxidation-reduction, and biodegradation. Sampling, detection, identification, and quantification of organic compounds in the environment. Gas and liquid chromatography and mass spectrometry. Prerequisites: university-level general chemistry and organic chemistry within last four years. C-L: Environment 240. One course. *Dubay*

**241. Atmospheric Chemistry and Air Pollution.** Chemical kinetics and equilibrium applied to the mechanistic and quantitative description of processes affecting the fates of anthropogenic and natural chemicals in the troposphere, on local, regional, and global scales.



Direct photolysis; gas-phase photo-formation and fates of ozone, radicals, and other oxidants; gas-phase oxidations of volatile organic compounds; gas-to-drop partitioning; aqueous-phase photoformation and fates of hydrogen peroxide, radicals, and other oxidants in the aqueous phases of clouds, fogs, and aerosols; effects of aqueous-phase reactions on the chemical composition of the troposphere; gas-phase and aqueous-phase oxidations of organic and inorganic compounds; stratospheric ozone depletion. Prerequisites: university-level general chemistry and organic chemistry within last four years. C-L: Environment 241. One course. *Staff*

**242. Environmental Aquatic Chemistry.** Principles of chemical kinetics and equilibria applied to quantitative description of the chemistry of lakes, rivers, oceans, groundwaters, and selected treatment processes. Equilibrium, steady state, and other kinetic models applied to processes such as the carbonate system, coordination chemistry, precipitation and dissolution, oxidation-reduction, photochemistry, adsorption, and heterogeneous reactions. Prerequisite: university-level general chemistry within last four years. C-L: Environment 242. One course. *Ahmann*

**243. Physicochemical Unit Operations in Water Treatment.** Fundamental bases for design of water and waste treatment systems, including transport, mixing, sedimentation and filtration, gas transfer, coagulation, and absorption processes. Emphasis on physical and chemical treatment combinations for drinking water supply. Prerequisite: Civil Engineering 124L. One course. *Kabala*

**244. Applied Microbial Processes.** Existing and novel microbial processes as they pertain to biotechnological products, specialty bioconversions, and to treat or exploit wastes. Concepts of microbiology, chemical engineering, the stoichiometry and kinetics of complex microbial metabolism, and process analysis. Specific processes such as carbon oxidation, vinegar and alcohol production, nitrification, methane production, biological electricity generation, recombinant protein secretion, and wastewater treatment in long-term space travel are discussed. Consent of instructor required. One course. *Staff*

**245. Pollutant Transport Systems.** Distribution of pollutants in natural waters and the atmosphere; diffusive and advective transport phenomena within the natural environment and through artificial conduits and storage/treatment systems. Analytical and numerical prediction methods. Prerequisites: Civil Engineering 122L and Mathematics 111 or equivalents. One course. *Medina*

**246. Water Supply Engineering Design.** The study of water resources and municipal water requirements including reservoirs, transmission, treatment and distribution systems; methods of collection, treatment, and disposal of municipal and industrial wastewaters. The course includes the preparation of a comprehensive engineering report encompassing all aspects of municipal water and wastewater systems. Field trips to be arranged. Prerequisite: Civil Engineering 124L or consent of instructor. One course. *Vesilind*

**247. Air Pollution Control Engineering.** The problems of air pollution with reference to public health and environmental effects. Measurement and meteorology. Air pollution control engineering: mechanical, chemical, and biological processes and technologies. One course. *Peirce*

**248. Solid Waste Engineering.** Engineering design of material and energy recovery systems including traditional and advanced technologies. Sanitary landfills and incineration of solid wastes. Application of systems analysis to collection of municipal refuse. Major design project in solid waste management. Prerequisite: Civil Engineering 124L or consent of instructor. C-L: Environment 248. One course. *Vesilind*



**249. Control of Hazardous and Toxic Waste.** Engineering solutions to industrial and municipal hazardous waste problems. Handling, transportation, storage, and disposal technologies. Biological, chemical, and physical processes. Upgrading abandoned disposal sites. Economic and regulatory aspects. Case studies. Consent of instructor required. One course. *Peirce*

**251. Systematic Engineering Analysis.** Mathematical formulation and numerical analysis of engineering systems with emphasis on applied mechanics. Equilibrium and eigenvalue problems of discrete and distributed systems; properties of these problems and discretization of distributed systems in continua by the trial functions with undetermined parameters. The use of weighted residual methods, finite elements, and finite differences. Prerequisites: senior or graduate standing. One course. *Laursen or S. Utku*

**252. Buckling of Engineering Structures.** An introduction to the underlying concepts of elastic stability and buckling, development of differential equation and energy approaches, buckling of common engineering components including link models, struts, frames, plates, and shells. Consideration will also be given to inelastic behavior, postbuckling, and design implications. Prerequisite: Civil Engineering 131L or consent of instructor. C-L: Mechanical Engineering 252. One course. *Virgin*

**254. Introduction to the Finite Element Method.** Investigation of the finite element method as a numerical technique for solving linear ordinary and partial differential equations, using rod and beam theory, heat conduction, elastostatics and dynamics, and advective/diffusive transport as sample systems. Emphasis placed on formulation and programming of finite element models, along with critical evaluation of results. Topics include: Galerkin and weighted residual approaches, virtual work principles, discretization, element design and evaluation, mixed formulations, and transient analysis. Prerequisites: a working knowledge of ordinary and partial differential equations, numerical methods, and programming in FORTRAN. One course. *Laursen*

**255. Nonlinear Finite Element Analysis.** Formulation and solution of nonlinear initial/boundary value problems using the finite element method. Systems include nonlinear heat conduction/diffusion, geometrically nonlinear solid and structural mechanics applications, and materially nonlinear systems (for example, elastoplasticity). Emphasis on development of variational principles for nonlinear problems, finite element discretization, and equation-solving strategies for discrete nonlinear equation systems. Topics include: Newton-Raphson techniques, quasi-Newton iteration schemes, solution of nonlinear transient problems, and treatment of constraints in a nonlinear framework. An independent project, proposed by the student, is required. Prerequisite: Civil Engineering 254 or consent of instructor. One course. *Laursen*

**260. Vadose Zone Hydrology.** Transport of fluids, heat, and contaminants through unsaturated porous media. Understanding the physical laws and mathematical modeling of relevant processes. Field and laboratory measurements of moisture content and matric potential. Prerequisites: Civil Engineering 122L and Mathematics 111, or consent of instructor. One course. *Kabala*

**261. Stochastic Subsurface Hydrology.** Stochastic partial differential equations of subsurface hydrology and their solutions for the first few concentration moments and for the full concentration probability density function. Local and nonlocal models. Formulation in terms of integral properties of porous media which account for heterogeneities that influence solute transport. Prerequisites: Civil Engineering 122L and Mathematics 111, or consent of instructor. One course. *Kabala*

**263. Multivariable Control.** Synthesis and analysis of multivariable linear dynamic feedback compensators. Standard problem formulation. Performance norms. Full state feedback and

linear quadratic Gaussian synthesis. Lyapunov and Riccati equations. Passivity, positivity, and self-dual realizations. Nominal performance and robust stability. Applications to vibration control, noise suppression, tracking, and guidance. Prerequisites: a course in linear systems and classical control, or consent of instructor. C-L: Electrical Engineering 263 and Mechanical Engineering 263. One course. *Bushnell, Clark, Gavin, or H. Wang*

**264. Physico-Bio-Chemical Transformations.** Surveys of a selection of topics related to the interaction between fluid flow (through channels or the porous media) and physical, chemical, and biochemical transformations encountered in environmental engineering. Numerous diverse phenomena, including solute transport in the vicinity of chemically reacting surfaces, reverse osmosis, sedimentation, centrifugation, ultrafiltration, rheology, microorganism population dynamics, and others will be presented in a unifying mathematical framework. Prerequisites: Civil Engineering 122L and Mathematics 111, or consent of instructor. One course. *Kabala*

**265. Advanced Topics in Civil and Environmental Engineering.** Opportunity for study of advanced subjects relating to programs within the civil and environmental engineering department tailored to fit the requirements of individuals or small groups. One course. *Staff*

**270. Environmental and Engineering Geophysics.** Use of geophysical methods for solving engineering and environmental problems. Theoretical frameworks, techniques, and relevant case histories as applied to engineering and environmental problems (including groundwater evaluation and protection, siting of landfills, chemical waste disposals, roads assessments, foundations investigations for structures, liquefaction and earthquake risk assessment). Introduction to theory of elasticity and wave propagation in elastic and poroelastic media, electrical and electromagnetic methods, and ground penetrating radar technology. Prerequisite: Mathematics 111 or Physics 52L or consent of instructor. One course. *Boadu*

**271. Inverse Problems in Geosciences and Engineering.** Basic concepts, theory, methods of solution, and application of inverse problems in engineering, groundwater modeling, and applied geophysics. Deterministic and statistical frameworks for solving inverse problems. Strategies for solving linear and nonlinear inverse problems. Bayesian approach to nonlinear inverse problems. Emphasis on the ill-posed problem of inverse solutions. Data collection strategies in relation to solution of inverse problems. Model structure identification and parameter estimation procedures. Prerequisite: Mathematics 111 or consent of instructor. One course. *Boadu*

**281. Experimental Systems.** Formulation of experiments; Pi theorem and principles of similitude; data acquisition systems; static and dynamic measurement of displacement, force, and strain; interfacing experiments with digital computers for data storage, analysis, and plotting. Students select, design, perform, and interpret laboratory-scale experiments involving structures and basic material behavior. Prerequisites: senior or graduate standing in engineering or the physical sciences. One course. *J. F. Wilson*

**283. Structural Dynamics.** Formulation of dynamic models for discrete and continuous structures; normal mode analysis, deterministic and stochastic responses to shocks and environmental loading (earthquakes, winds, and waves); introduction to nonlinear dynamic systems, analysis and stability of structural components (beams and cables and large systems such as offshore towers, moored ships, and floating platforms). One course. *J. F. Wilson*

## **COURSES CURRENTLY UNSCHEDULED**

**99. Structures in Byzantine Architecture.**

**202. Advanced Mechanics of Solids II.**

**205. Elasticity.**

- 209. Kinetics and Reactor Design.
- 212. Mechanical Behavior and Fracture of Materials.
- 215. Engineering Systems Analysis.
- 226. Operational Hydrology.
- 232. Reinforced Concrete Design.
- 234. Advanced Structural Design in Metals.
- 235. Foundation Engineering.
- 236. Earth Structures.
- 238. Rock Mechanics.
- 239. Physical Properties of Soils.
- 257. Structural Optimization.
- 258. Analysis of Dynamic and Nonlinear Behavior of Structures.

## THE MAJOR

The major requirements are included in the minimum of thirty-four courses listed under general requirements and departmental requirements. The following specific courses must be included: Engineering 75L, 115, 123L, and 150L; Civil Engineering 122L, 131L, and 192. In addition, Engineering 24L and 25L, or a higher level environmental engineering and structural engineering course, respectively, must be included.

## Electrical and Computer Engineering (EE)

Professor Gelenbe, *Chair*; Visiting Professor McCumber, *Director of Undergraduate Studies*; Professors Casey, Fair, Joines, Marinos, Nolte, Trivedi, and P. Wang; Associate Professors Board, Carin, Dewey, Kedem, Krolik, Massoud, Samulski, and Schmajuk; Assistant Professors Collins, Daniels-Race, George, Hansen, Lebeck, and H. Wang; Professors Emeritus Owen and Wilson; Assistant Research Professor Ybarra; Adjunct Professors Lontz, Marin, and Strocio; Adjunct Associate Professors Derby and Kanopoulos; Adjunct Assistant Professors Bushnell, Morizio, Onvural, Palmer, Spano, and Strole; Visiting Professor Kaiser

A major in electrical engineering is available in this department. This major program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Electrical engineering is a broadly-based engineering discipline dealing with the processing, control, and transmission of information and energy by making use of electrical and electromagnetic phenomena. Electrical engineers design, build, and make extensive use of computers.

The goals of the Electrical Engineering Program at Duke are to help students develop: a solid understanding of the engineering sciences and of the practice of engineering design; the ability to formulate and solve problems; the ability to think critically; the ability to communicate well in the written and spoken word and in the language of mathematics; the ability to understand the social, economic, ethical and environmental implications of their work; the ability to work individually, as well as in teams, and to manage the work of others; and a commitment to life-long learning and professional development. Most Duke electrical engineers graduate to a first job in engineering or management, to graduate or professional schools, or to an ROTC appointment in the armed forces.

The Electrical Engineering Program builds upon a logical progression from basic principles to more advanced and specialized topics. To ensure breadth of exposure, each student must choose a minimum of two upper-level electrical engineering courses in each of two concentration areas among computer engineering, signal processing and communications, solid-state electronics and circuits, systems and robotics, and electromagnetic fields and optics. These course sequences prepare students for professional work in at least two areas of concentration. They reinforce in those students expecting to enter fields such as medicine or law the broad relevance of the powerful problem-solving



methodologies of engineering, and they illuminate some of the exciting productivity enabling possibilities of sophisticated uses of computers and information technology. Many students explore additional areas more deeply either by taking additional advanced courses or by independent study with faculty experts in the field. The total program provides an excellent foundation for continuing professional development after graduation.

Engineering design is integrated throughout the curriculum. In addition, prior to graduation, each electrical engineering major must complete an approved design course which requires significant design experience and integrates science, engineering and design principles learned in prior courses into a meaningful design outcome.

The major program is sufficiently flexible to permit motivated students to complete the requirements for a second major in such areas as biomedical engineering, computer science, physics, mathematics, economics, public policy studies, and others. Interests such as premedicine, prelaw, art, music, psychology, and social sciences can be accommodated through individually designed programs.

Students are encouraged to take more than the minimum required courses in the sciences and the liberal arts, as is fitting at an engineering school in a university with a strong liberal-arts tradition. In addition, juniors and seniors can, with proper planning, participate in international programs. These include a semester of study abroad, the International Honors Program, and an International Telecommunications Program which leads to a master's degree.

Classroom lectures are enhanced and augmented by intensive use of the department's extensive computer and laboratory facilities. The department maintains over eighty networked computer workstations, servers and X-terminals interconnected via an Ethernet network which also gives access to campus, regional and international data networks, including the Internet. Undergraduate laboratories are well-equipped with electronic components, digitizing oscilloscopes, PC-controlled instrumentation, logic analyzers, and commercial-quality CAD tools for system and IC design. Laboratories and equipment are also available for microprocessor and computer architecture studies, rapid system prototyping, custom integrated circuit design and testing, integrated circuit fabrication, digital speech processing, image processing, robotics, digital communications, and microwaves. These facilities are important to the undergraduate program since they permit students to become very familiar with the devices and design tools of practicing electrical engineers through scheduled laboratory experiments, projects, and independent study with faculty members engaged in research. Current areas of research include computer engineering, computer architecture, fault-tolerant computer systems, scientific computing, parallel processing, VLSI CAD tools, signal processing, digital speech processing, signal detection and estimation, ocean acoustic signal processing, image processing, neural networks, fuzzy logic, solid-state electronics, integrated circuit processing and process simulation, molecular beam epitaxy, III-V compound semiconductor materials and devices, machine intelligence, and applications of electromagnetic fields and waves.

**61L. Introduction to Electric Circuits.** Techniques for analyzing linear circuits. Nodal and mesh analysis, superposition and linearity, Thevenin and Norton equivalent circuits, operational amplifiers, energy storage, transient analysis, phasors and impedance, RMS values, AC power, frequency response, resonance, and filters. Circuit simulation using SPICE. Prerequisite: Mathematics 32. One course. *George, McCumber, or Ybarra*

**62L. Introduction to Electronics: Devices.** Integrated-circuit fabrication. Fundamentals of semiconductor physics. Device modeling. Basic device operation,  $I(V)$  characteristics, temperature effects, capacitance effects, equivalent circuit and SPICE models, high-frequency and switching properties of: PN junction diodes, Schottky barriers, bipolar-junction transistors, MOS capacitors, and field-effect transistors. Basic electronic circuits; electronic-circuit analysis and design. Prerequisite: Electrical Engineering 61L. One course. *Casey, Daniels-Race, or Massoud*



**64. Fundamentals of Linear System Theory.** Signal representations, system response, convolution, correlation; Fourier series and transforms, transfer functions; Laplace transforms, state variables, stability; discrete signals and transforms, fast Fourier transform; z transforms. Applications to networks, modulation, sampling, filtering. Computer solutions of problems using MAPLE and SPICE. Prerequisite: Electrical Engineering 61L. One course. *McCumber or H. Wang*

**141. Linear Control Systems.** Analysis and design of feedback control systems. Block diagram and signal flow graph system models. Servomechanism characteristics, steady-state errors, sensitivity to parameter variations and disturbance signals. Time domain performance specifications. Stability. Root locus, Nyquist, and Bode analysis; design of compensation circuits; closed loop frequency response determination. Introduction to time domain analysis and design. Prerequisite: Electrical Engineering 64 or consent of instructor. One course. *Wang*

**142. Introduction to Robotics and Automation.** Fundamental notions in robotics, basic configurations of manipulator arm design, coordinate transformations, control functions, and robot programming. Applications of artificial intelligence, machine vision, force/torque, touch and other sensory subsystems. Design for automatic assembly concepts, tools, and techniques. Application of automated and robotic assembly costs, benefits, and economic justification. Selected laboratory and programming assignments. Prerequisites: Electrical Engineering 64 and consent of instructor. One course. *Staff*

**148L. Electrical Energy Systems.** Electrical systems including energy distribution, static, linear, and rotary energy conversion, and control functions, linear and discrete, for energy conversion. DC and steady-state AC circuits. Transmission lines for distribution and signal transfer. Studies of static transformers, linear transducers, and rotary machines. Control theory applied to system operation. Laboratory. Prerequisites: Physics 52L and either Electrical Engineering 61L or Mathematics 111. One course. *George*

**151L. Introduction to Switching Theory and Logic Design.** Techniques for the analysis and design of combinational and sequential networks. Discrete mathematical systems, binary arithmetic, Boolean algebra, minimization of functions, synchronous and fundamental mode sequential circuit design, design with MSI and LSI components, and special properties of switching functions are covered. Selected laboratory work. C-L: Computer Science 120L. One course. *Marinos or Strole*

**152L. Introduction to Computer Architecture.** Architecture and organization of digital computer systems. Processor operation, computer arithmetic, instruction set design. Assembly language programming. Selected hardware and software exercises culminating in the design, simulation, and implementation in FPGA technology of the major components of a complete computer system. Not open to students who have taken Computer Science 104. Prerequisite: Electrical Engineering 151L. One course. *Board*

**156. Computer Network Architecture.** The architecture of computer communication networks and the hardware and software required to implement the protocols that define the architecture. Basic communication theory, transmission technology, private and common carrier facilities. International standards. Satellite communications and local area networks. Performance analysis and modeling of communication networks. Prerequisite: Electrical Engineering 151L. One course. *Onvural*

**157. Computer Network Analysis and Design.** Graph representation of networks. Network design problems as graph optimization problems; related graph algorithms. Elementary queuing models and formulae. Network performance issues. Modern high-speed computer-communication networks. Packet switching. Network protocols. Broadband integrated

services networks (B-ISDN) and the asynchronous transfer mode (ATM). Network admission and congestion controls. One course. *Staff*

**159. Discrete Mathematics.** Mathematics as applied to finite and infinite collections of discrete objects, including techniques for solving engineering problems involving finite and infinite sets, permutations and combinations of elements, discrete numeric functions, finite and infinite sums. Mathematical methods needed to tackle real-world problems in computer engineering, applied mathematics, computer science, and engineering. One course. *Marin*

**163L. Introduction to Electronics: Integrated Circuits.** Analysis and design of electronic circuits in bipolar and MOS technologies, with emphasis on both large-signal and small-signal methods. Circuits for logic gates, latches, and memories. Single-stage and multistage amplifiers and op amps. Circuits with feedback, including stability and frequency response considerations. Analog and mixed analog/digital circuit applications. Extensive use of SPICE for circuit simulation. Prerequisite: Electrical Engineering 62L. One course. *Derby or Fair*

**164L. Electronic Design Projects.** Electronics project laboratory in which individuals or small teams, build, and test custom designed circuits or small systems to gain experience in the design process. Requirements: a written plan, project organization, a written report describing the project and test results, a presentation to the class of the constructed project. Enrollment limited to 20. Prerequisites: Electrical Engineering 163L (or Biomedical Engineering 163L with consent of instructor) and at least one of 141, 151L, or 181. One course. *George*

**170L. Introduction to Electromagnetic Fields.** Postulatory treatment of electromagnetic fields based on Maxwell's equations. Discussion of the Lorentz force equation and the Poynting theorem. Treatment of propagation, reflection, and transmission of plane waves through various media and dielectric interfaces. Introduction to electrostatic and magnetostatic fields and potential functions. Prerequisites: Mathematics 104 or 111 and Physics 52L. One course. *Carin, Joines, or Palmer*

**171. Applications of Electromagnetic Fields and Waves.** Solution techniques applied to static and dynamic field problems. Discussions and example applications include the following topics: waves and transmission lines, waveguides and resonators, antennas and radiation, and electromagnetic forces and energy. Prerequisite: Electrical Engineering 170L. One course. *Carin or Joines*

**176. Thermal Physics.** Thermal properties of matter treated using the basic concepts of entropy, temperature, chemical potential, partition function, and free energy. Topics include the laws of thermodynamics, ideal gases, thermal radiation and electrical noise, heat engines, Fermi-Dirac and Bose-Einstein distributions, semiconductor statistics, kinetic theory, and phase transformations. Prerequisites: Mathematics 103 or equivalent and Physics 51L, 52L or equivalent. C-L: Physics 176. One course. *Socular*

**181. Fundamentals of Signal Processing and Communications.** The fundamentals of signal representation and system characterization used in digital signal processing and communications. Communication systems: basic concepts in amplitude modulation, frequency division multiplexing, amplitude shift keying, pulse code modulation, matched filtering. Discrete-time signal processing: discrete-time systems, response with noisy excitation, introduction to digital filter design, discrete Fourier transform, fast Fourier transform. Computer applications in selected areas using MATLAB. Prerequisites: Electrical Engineering 64 and Mathematics 135 or Statistics 113, or consent of instructor. One course. *Collins*

**182. Digital Filter Design.** A treatment of the theory and application of processing of discrete time data. Special attention will be given to the design and implementation of both finite impulse response (FIR) and infinite impulse response (IIR) digital filters. Bilinear transformations, filter design based on Butterworth, Chebyshev, and elliptic approximations, transversal filters, effects of quantization and finite word length arithmetic in digital filters. Applications of digital signal processing in such areas as image, sonar/radar, and speech communications. Prerequisite: Electrical Engineering 181. One course. *Krolík*

**187. Digital Telecommunications.** Examination of existing telephone networks in the U.S. with emphasis on the transition from analog to digital systems. Sequential processes of encoding, transmission, switching, and network hierarchy. Consideration of the problems which must be solved in the transition from analog to digital networks. Prerequisite: Electrical Engineering 181. One course. *Staff*

**189. Image Processing.** Basic concepts of the manipulation and analysis of images by computer, linear operations on pictures, Fourier transform and 2-D Z-transform, hexagonal sampling theorem, image transforms, image enhancement, image filtering and restoration, image coding, matching, segmentation, representation and description. Project presentation by students. Prerequisites: Electrical Engineering 181 and Mathematics 135. One course. *Staff*

**191, 192. Undergraduate Research in Electrical Engineering.** For juniors only. Half course or one course each. Variable credit. *Staff*

**193, 194. Undergraduate Research in Electrical Engineering.** For seniors only. Half course or one course each. Variable credit. *Staff*

**195, 196. Special Topics in Electrical Engineering.** Study of selected topics in electrical engineering tailored to fit the requirements of a small group. Consent of instructor and director of undergraduate studies required. Half course or one course each. Variable credit. *Staff*

**197, 198. Projects in Electrical Engineering.** A course which may be undertaken only by seniors who are enrolled in the graduation with distinction program or who show special aptitude for individual project work. Elective for electrical engineering majors. Consent of director of undergraduate studies required. Half course to two courses each. Variable credit. *Staff*

**211. Quantum Mechanics.** Discussion of wave mechanics including elementary applications, free particle dynamics, Schrödinger equation including treatment of systems with exact solutions, and approximate methods for time-dependent quantum mechanical systems with emphasis on quantum phenomena underlying solid-state electronics and physics. Prerequisite: Mathematics 111 or equivalent. One course. *Staff*

**214. Introduction to Solid-State Physics.** Discussion of solid-state phenomena including crystalline structures, X-ray and particle diffraction in crystals, lattice dynamics, free electron theory of metals, energy bands, and superconductivity, with emphasis on understanding electrical and optical properties of solids. Prerequisite: quantum physics at the level of Physics 143L or Electrical Engineering 211. C-L: Physics 214. One course. *Daniels-Race or Teitsworth*

**215. Semiconductor Physics.** A quantitative treatment of the physical processes that underlie semiconductor device operation. Topics include band theory and conduction phenomena; equilibrium and nonequilibrium charge carrier distributions; charge generation, injection, and recombination; drift and diffusion processes. Prerequisite: Electrical Engineering 211 or consent of instructor. One course. *Staff*



**216. Devices for Integrated Circuits.** Derivation of basic semiconductor properties such as the effective mass, effective density of states, SHR recombination, avalanche breakdown and energy-band diagrams. Application of the continuity equation, Gauss' law, and Poisson's equation to obtain the I-V and C-V behavior of Si and GaAs Schottky barriers, GaAs MESFETs; Si JFETs, bipolar transistors and MOSFETs. Relation of device physics to SPICE parameters. Four laboratory exercises. One course. *Casey*

**217. Analog Integrated Circuits.** Analysis and design of bipolar and CMOS analog integrated circuits. SPICE device models and circuit macromodels. Classical operational amplifier structures, current feedback amplifiers, and building blocks for analog signal processing, including operational transconductance amplifiers and current conveyors. Biasing issues, gain and bandwidth, compensation, and noise. Influence of technology and device structure on circuit performance. Extensive use of industry-standard CAD tools, such as Analog Workbench. Prerequisite: Electrical Engineering 216. One course. *Staff*

**218. Integrated Circuit Engineering.** Basic processing techniques and layout technology for integrated circuits. Photolithography, diffusion, oxidation, ion implantation, and metallization. Design, fabrication, and testing of integrated circuits. Prerequisite: Electrical Engineering 216. One course. *Fair*

**219. Digital Integrated Circuits.** Analysis and design of digital integrated circuits. IC technology. Switching characteristics and power consumption in MOS devices, bipolar devices, and interconnects. Analysis of digital circuits implemented in NMOS, CMOS, TTL, ECL, and BiCMOS. Propagation delay modeling. Analysis of logic (inverters, gates) and memory (SRAM, DRAM) circuits. Influence of technology and device structure on performance and reliability of digital ICs. SPICE modeling. Prerequisites: Electrical Engineering 151L and 216. One course. *Massoud*

**241. Linear System Theory and Optimal Control.** Consideration of system theory fundamentals; observability, controllability, and realizability; stability analysis; linear feedback, linear quadratic regulators, Riccati equation, and trajectory tracking. Prerequisite: Electrical Engineering 141. One course. *Bushnell, H. Wang, or P. Wang*

**243. Pattern Classification and Recognition.** Parameter estimation and supervised learning, nonparametric techniques, linear discriminant functions, clustering, language theory related to pattern recognition, examples from areas such as character and severe weather recognition, classification of community health data, recognition of geometrical configurations, algorithms for recognizing low resolution touch-sensor array signatures and 3-D objects. Consent of instructor required. One course. *P. Wang*

**245. Digital Control Systems.** Review of traditional techniques used for the design of discrete-time control systems; introduction of "nonclassical" control problems of intelligent machines such as robots. Limitations of the assumptions required by traditional design and analysis tools used in automatic control. Consent of instructor required. One course. *Staff*

**246. Optimal Control.** Review of basic linear control theory and linear/nonlinear programming. Dynamic programming and the Hamilton-Jacobi-Bellman Equation. Calculus of variations. Hamiltonian and costate equations. Pontryagin's Minimum Principle. Solution to common constrained optimization problems. This course is designed to satisfy the need of several engineering disciplines. Prerequisite: Electrical Engineering 141 or equivalent. C-L: Mechanical Engineering 232. One course. *Bushnell*

**251. Advanced Digital System Design.** Theory and hands-on experience in advanced digital system design. High-speed design, high complexity design (more than 10,000 gates), implementation technology selection, system modeling, power and clock distribution, line termination, and cooling. Case studies and demonstrations. Extensive use of CAD tools for



logic minimization, logic synthesis, and system simulation. Rapid system prototyping with off-the-shelf and custom components. Laboratory exercises and a semester project. Prerequisites: Electrical Engineering 151L and 163L (or Biomedical Engineering 163L with consent of instructor). One course. *Marinos*

**252. Advanced Digital Computer Architecture.** A second course on computer architecture. Definition of high-performance computing. Performance measurement. Memory organization, cache hierarchies, and virtual memory. Instruction set design, instruction pipelining, superscalar processing. Vector processing. High-performance input/output. Multiprocessor interconnection networks, communications, and synchronization. Survey of current architectures. Prerequisite: Computer Science 104 or Electrical Engineering 152L. One course. *Board*

**253. Parallel System Performance.** Intrinsic limitations to computer performance. Amdahl's Law and its extensions. Components of computer architecture and operating systems, and their impact on the performance available to applications. Intrinsic properties of application programs and their relation to performance. Task graph models of parallel programs. Estimation of best possible execution times. Task assignment and related heuristics. Load balancing. Specific examples from computationally intensive, I/O intensive, and mixed parallel and distributed computations. Global distributed system performance. Prerequisites: Computer Science 110; Electrical Engineering 151L and 152L. One course. *Gelenbe*

**254. Fault-Tolerant and Testable Computer Systems.** Faults and failure mechanisms, test generation techniques and diagnostic program development for detection and location of faults in digital networks; design for testability, redundancy techniques, self-checking and fail-safe networks, fault-tolerant computer architectures. Prerequisite: Electrical Engineering 151L or equivalent. C-L: Computer Science 225. One course. *Marinos*

**255. Mathematical Methods for Systems Analysis I.** Basic concepts and techniques used in the stochastic modeling of systems. Elements of probability, statistics, queuing theory, and simulation. Prerequisite: four semesters of college mathematics. C-L: Computer Science 226. One course. *Trivedi*

**257. Performance and Reliability of Computer Networks.** Methods for performance and reliability analysis of local area networks as well as wide area networks. Probabilistic analysis using Markov models, stochastic Petri nets, queuing networks, and hierarchical models. Statistical analysis of measured data and optimization of network structures. Prerequisites: Electrical Engineering 156 and 255. One course. *Trivedi*

**258. Artificial Neural Networks.** Elementary biophysical background for signal propagation in natural neural systems. Artificial neural networks (ANN) and the history of computing; early work of McCulloch and Pitts, of Kleene, of von Neumann and others. The McCulloch and Pitts model. The connectionist model. The random neural network model. ANN as universal computing machines. Associative memory; learning; algorithmic aspects of learning. Complexity limitations. Applications to pattern recognition, image processing and combinatorial optimization. Prerequisite: Electrical Engineering 151L. One course. *Gelenbe*

**261. Full Custom VLSI Design.** A first course in VLSI design with CMOS technologies. A study of devices, circuits, fabrication technology, logic design techniques, subsystem design and system architecture. Modeling of circuits and subsystems. Testing of gates, subsystems and chips, and design for testability. The fundamentals of full-custom design, and some semi-custom design. Prerequisite: Electrical Engineering 151L or equivalent; Electrical

Engineering 163L (or Biomedical Engineering 163L with consent of instructor) or equivalent. One course. *Morizio*

**262. Advanced VLSI Design and Test.** An advanced course in VLSI design with emphasis on the design of application specific IC's (ASIC) for a given set of specifications. Discussions of available technologies for ASIC implementation and tradeoffs in using these technologies. Static and dynamic CMOS design of commonly used circuits (adders, multipliers, RAM, pads). Packaging and testing of ASIC's with emphasis on functional and performance verification. This course stresses the design of ASIC's within a systems design environment and with the use of appropriate design tools that can be used to validate a design based on a given set of design specifications. Prerequisite: Electrical Engineering 261. One course. *Dewey*

**263. Multivariable Control.** Prerequisites: a course in linear systems and classical control, or consent of instructor. See C-L: Civil Engineering 263; also C-L: Mechanical Engineering 263. One course. *Bushnell, Clark, Gavin, or H. Wang*

**266. VLSI Design Verification Techniques.** VLSI verification tool design. Design and capabilities of circuit simulation, timing simulation, logic simulation, and functional simulation. Techniques applied in timing verification and other static verification tools. Parallel processing and its application to simulation. Physical design issues related to verification. Prerequisite: Electrical Engineering 261, working knowledge of C. One course. *Staff*

**269. VLSI Chip Testing.** Introduction to VLSI chip and system testing. Testing theory, strategies, and fault identification. Hands-on testing experience with faulty chips and systems, chips designed in Electrical Engineering 261, and testing equipment available in the department. Prerequisite: Electrical Engineering 261. One course. *Staff*

**271. Electromagnetic Theory.** The classical theory of Maxwell's equations; electrostatics, magnetostatics, boundary value problems including numerical solutions, currents and their interactions, and force and energy relations. Three class sessions. Consent of instructor required. One course. *Carin or Joines*

**272. Electromagnetic Communication Systems.** Review of fundamental laws of Maxwell, Gauss, Ampere, and Faraday. Elements of waveguide propagation and antenna radiation. Analysis of antenna arrays by images. Determination of gain, loss, and noise temperature parameters for terrestrial and satellite electromagnetic communication systems. Prerequisite: Electrical Engineering 170L or 271. One course. *Joines*

**273. Optical Communication Systems.** Mathematical methods, physical ideas, and device concepts of optoelectronics. Maxwell's equations, and definitions of energy density and power flow. Transmission and reflection of plane waves at interfaces. Optical resonators, waveguides, fibers, and detectors are also presented. Prerequisite: Electrical Engineering 170L or equivalent. One course. *Joines*

**274. Modern Optics I.** Optical processes including the propagation of light, coherence, interference, and diffraction. Consideration of the optical properties of solids with applications of these concepts to lasers and modern optical devices. Lecture and laboratory projects. C-L: Physics 185. One course. *Guenther*

**275. Microwave Electronic Circuits.** Microwave circuit analysis and design techniques. Properties of planar transmission lines for integrated circuits. Matrix and computer-aided methods for analysis and design of circuit components. Analysis and design of input, output, and interstage networks for microwave transistor amplifiers and oscillators. Topics on

stability, noise, and signal distortion. Prerequisite: Electrical Engineering 170L or equivalent. One course. *Joines*

**276. Laser Physics.** Prerequisites: Electrical Engineering 170L or Physics 182 and Electrical Engineering 211 or Physics 211. See C-L: Physics 261. One course. *Skatrud*

**281. Random Signals and Noise.** Introduction to mathematical methods of describing and analyzing random signals and noise. Review of basic probability theory; joint, conditional, and marginal distributions; random processes. Time and ensemble averages, correlation, and power spectra. Optimum linear smoothing and predicting filters. Introduction to optimum signal detection, parameter estimation, and statistical signal processing. Prerequisite: Mathematics 135 or Statistics 113. One course. *Collins or Hansen*

**282. Digital Signal Processing.** Introduction to the fundamentals of processing signals by digital techniques with applications to practical problems. Discrete time signals and systems, elements of the Z-transform, discrete Fourier transforms, digital filter design techniques, fast Fourier transforms, and discrete random signals. One course. *Nolte*

**283. Digital Communication Systems.** Digital modulation techniques. Coding theory. Transmission over bandwidth constrained channels. Signal fading and multipath effects. Spread spectrum. Optical transmission techniques. Prerequisite: Electrical Engineering 281 or consent of instructor. One course. *Staff*

**284. Acoustics and Hearing.** Prerequisites: Mathematics 111 and Physics 52L or equivalents. See C-L: Biomedical Engineering 235. One course. *Collins or Trahey*

**285. Signal Detection and Extraction Theory.** Introduction to signal detection and information extraction theory from a statistical decision theory viewpoint. Subject areas covered within the context of a digital environment are decision theory, detection and estimation of known and random signals in noise, estimation of parameters and adaptive recursive digital filtering, and decision processes with finite memory. Applications to problems in communication theory. Prerequisite: Electrical Engineering 281 or consent of instructor. One course. *Nolte*

**286. Digital Processing of Speech Signals.** Detailed treatment of the theory and application of digital speech processing. Modeling of the speech production system and speech signals; speech processing methods; digital techniques applied in speech transmission, speech synthesis, speech recognition, and speaker verification. Acoustic-phonetics, digital speech modeling techniques, LPC analysis methods, speech coding techniques. Application case studies: synthesis, vocoders, DTW (dynamic time warping)/HMM (hidden Markov modeling) recognition methods, speaker verification/identification. Prerequisite: Electrical Engineering 182 or equivalent or consent of instructor. One course. *Hansen*

**287. Underwater Communications.** Elements of communication theory and digital signal processing are combined with basic physics and oceanography to offer an overview of underwater communications, with an emphasis on the radar/sonar problem. Beamforming with transducer arrays. Signal design and target resolution; the ambiguity function. The ocean as a communication channel: sound propagation and ambient noise characteristics. Performance analysis of selected communication scenarios and case studies of operational sonar systems. Prerequisite: Electrical Engineering 181 or consent of instructor. One course. *Staff*

**288. Image and Array Signal Processing.** Multidimensional digital signal processing with applications to practical problems in image and sensor array processing. Two-dimensional discrete signals and systems, discrete random fields, 2-D sampling theory, 2-D transforms, image enhancement, image filtering and restoration, space-time signals, beamforming, and



inverse problems. Prerequisite: Electrical Engineering 282 or consent of instructor. One course. *Krolik*

**289. Adaptive Filters.** Adaptive digital signal processing with emphasis on the theory and design of finite-impulse response adaptive filters. Stationary discrete-time stochastic processes, Wiener filter theory, the method of steepest descent, adaptive transverse filters using gradient-vector estimation, analysis of the LMS algorithm, least-squares methods, recursive least squares and least squares lattice adaptive filters. Application examples in noise cancelling, channel equalization, and array processing. Prerequisites: Electrical Engineering 281 and 282 or consent of instructor. One course. *Krolik*

**299. Advanced Topics in Electrical Engineering.** Opportunity for study of advanced subjects related to programs within the electrical engineering department tailored to fit the requirements of a small group. Consent of director of undergraduate studies and of supervising instructor required. One course. *Staff*

## THE MAJOR

The major requirements are included in the minimum total of 34 courses listed under the general requirements and departmental requirements. The program of courses must include an approved electrical engineering course which must be taken in the junior or senior year of the program. This course must have as a prerequisite at least one course in the discipline.

## Mechanical Engineering and Materials Science (ME)

Professor Cocks, *Chair*; Associate Professor Knight, *Director of Undergraduate Studies*; Professors Bejan, Dowell, Garg, Gosele, Harman, Hochmuth, Pearsall, Shaughnessy, Shepard, and Tan; Associate Professors Bliss, Eom, Hall, Jones, Needham, Quinlan, Virgin, and Wright; Assistant Professors Clark and Howle; Associate Research Professor Zhong; Assistant Research Professors Florea, Galbraith, Ping-Beall, Thomas, and Zhelev; Adjunct Professors Lee and Wu; Adjunct Associate Professor Crowson; Adjunct Assistant Professor Jenkins

A major in mechanical engineering is available in this department. The mechanical engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Mechanical engineers are concerned with the optimum use of materials, energy, time, and individual effort to serve societal needs through the design of machines, structures, and mechanical and thermal systems, and through better understanding of dynamic processes involving these systems. They have a wide involvement in many industries including product manufacturing, transportation, power generation, construction, aerospace, electronics, biomechanical and biomedical engineering, and national defense. Within these industries, the engineer might specialize in the design of machinery or fluid handling systems, the analysis of heat transfer from electronics packages or of vibration in mechanical systems, the automation of manufacturing processes, the efficient operation of industrial plants, the marketing of technical products or services, or any of a number of other activities. The individual's contribution may lie anywhere in the spectrum from highly theoretical to imminently practical, and often involves operating as an engineering manager.

Because mechanical engineers in industry and research engage in such a great variety of activities, their education must be broadly based. Although individual engineers may specialize within their industry positions or in graduate study, each must have the background needed to contribute in any of several technical areas, to combine knowledge of multiple topics when necessary, and to interact with members of other disciplines and professions in accomplishing engineering goals. Thus the mechanical engineer's program of



study must include fundamental grounding in mathematics and basic sciences, applications in several engineering sciences, and team-based experience in the process of design, where theory is applied in the context of real needs and limitations and where judgment must be exercised. Furthermore, to be a responsible member of the engineering profession, each graduate must be aware of social, ethical, environmental and economic factors and constraints on engineering activity, and must understand the importance of these matters in a global context.

With these considerations in mind, the goals of the undergraduate mechanical engineering program are to provide:

- the knowledge, skills, and credentials needed to be successful at the entry level of the practice of engineering.

- the preparation necessary to undertake the initial steps leading to professional registration.

- an educational preparation for graduate or professional study.

- an educational background that is the basis for professional growth and leadership throughout a career that may encompass a broad range of endeavors, both technical and nontechnical.

The curriculum capitalizes on the exceptional abilities of our highly select students to cultivate the learning, thinking, and problem-solving abilities needed to adapt, to develop, and to exercise responsible leadership through times of rapid change. The program provides firm preparation in the essential engineering topics while allowing wide flexibility for students to pursue their own specialized interests.

**11, 12. Undergraduate Research in Mechanical Engineering.** An elective program in which undergraduate students participate in an ongoing program of research with mechanical engineering faculty members. The research topic pursued by the student is arranged by mutual agreement between the student and the participating faculty member. For freshmen only. One course each. *Staff*

**101L. Thermodynamics.** The principal laws of thermodynamics for open and closed systems and their application in engineering. Properties of the pure substance, relationships among properties, mixtures and reactions. Power and refrigeration cycle analysis. Prerequisite: Physics 52L. One course. *Harman or Hochmuth*

**115L. Failure Analysis and Prevention.** A study and analysis of the causes of failure in engineering materials and the diagnosis of those causes. Elimination of failures through proper material selection, treatment, and use. Case histories. Examination of fracture surfaces. Laboratory investigations of different failure mechanisms. Prerequisites: Engineering 75L and 83L or consent of instructor. One course. *Cocks, Jones, or Pearsall*

**125L. Measurement and Modeling of Dynamic Systems.** Mathematical modeling of mechanical, electrical, fluid, and thermal systems. State variables, linearization methods, transfer functions and block diagrams, feedback techniques for control of dynamic systems. Analysis, design, and application of instrumentation. Experimental laboratory using computer based data acquisition and processing. Prerequisite: Engineering 123L. One course. *Clark or Virgin*

**126L. Fluid Mechanics.** An introductory course emphasizing the application of the principles of conservation of mass, momentum, and energy to a fluid system. Physical properties of fluids, dimensional analysis and similitude, viscous effects and integral boundary layer theory, subsonic and supersonic flows, normal shock waves. Selected laboratory work. Corequisites: Engineering 123L and Mechanical Engineering 101L. One course. *Bliss, Hall, Hochmuth, Knight, or Shaughnessy*

**141L. Mechanical Design.** A study of practical aspects of mechanical design including conceptualization, specifications, and selection of mechanical elements. The design and application of mechanical components such as gears, cams, bearings, springs, and shafts. Practice in application of the design process through design projects. Prerequisite: Engineering 83L. One course. *Wright*

**150L. Heat and Mass Transfer.** A rigorous development of the laws of mass and energy transport as applied to a continuum. Energy transfer by conduction, convection, and radiation. Free and forced convection across boundary layers. Application to heat exchangers. Selected laboratory work. Prerequisites: Mathematics 111 and Mechanical Engineering 126L. One course. *Howle or Hochmuth*

**160L. Mechanical Systems Design.** An integrative design course addressing both creative and practical aspects of the design of systems. Development of the creative design process, including problem formulation and needs analysis, feasibility, legal, economic and human factors, aesthetics, safety, synthesis of alternatives, and design optimization. Application of design methods through several projects including a term design project. Prerequisites: Mechanical Engineering 141L and 150L. One course. *Staff*

**165. Special Topics in Mechanical Engineering.** Study arranged on a special engineering topic in which the faculty has particular interest and competence as a result of research and professional activities. Consent of instructor and director of undergraduate studies required. Half course or one course each. Variable credit. *Staff*

**183. Power Generation.** Basic concepts of thermodynamics, heat transfer, and fluid flow applied to power generation processes. Nuclear reaction theory and reactor technology; fossil fuel combustion theory and modern boiler practice. Power plant ancillary equipment and processes. Design considerations and analyses include economic and environmental factors. One course. *Harman*

**198. Projects in Mechanical Engineering.** Individual projects arranged in consultation with a faculty member. Open only to seniors enrolled in the graduation with distinction program or showing special aptitude for research. Half course to two courses. Prerequisites: B average and consent of the director of undergraduate studies. Variable credit. *Staff*

**202. Engineering Thermodynamics.** Axiomatic formulations of the first and second laws. General thermodynamic relationships and properties of real substances. Energy, availability, and second law analysis of energy conversion processes. Reaction and multiphase equilibrium. Power generation. Low temperature refrigeration and the third law of thermodynamics. Thermodynamic design. One course. *Bejan*

**207. Transport Phenomena in Biological Systems.** See C-L: Biomedical Engineering 207; also C-L: Civil Engineering 207. One course. *Katz, Truskey, or Yuan*

**209. Soft Wet Materials and Interfaces.** The materials science and engineering of soft wet materials and interfaces. Emphasis on the relationships between composition, structure, properties and performance of macromolecules, self assembling colloidal systems, linear polymers and hydrogels in aqueous and nonaqueous liquid media, including the role of water as an "organizing" solvent. Applications of these materials in biotechnology, medical technology, microelectronic technology, and nature's own designs of biological materials. One course. *Needham*

**210. Intermediate Dynamics.** Comprehensive treatment of the dynamic motion of particles and rigid bodies with an introduction to nonlinear dynamics and the vibration of continuous systems. Topics include: conservation of linear and angular momentum, superposition applied to linear systems, motion in inertial and noninertial frames of reference, Hamilton's

principle and Lagrange's equations, and generalized coordinates. C-L: Civil Engineering 210. One course. *Hall or Knight*

**211. Theoretical and Applied Polymer Science.** An advanced course in materials science and engineering dealing specifically with the structure and properties of polymers. Particular attention paid to recent developments in the processing and use of modern plastics and fibers. Product design considered in terms of polymer structures, processing techniques, and properties. C-L: Biomedical Engineering 208. One course. *Pearsall*

**212. Electronic Materials.** An advanced course in materials science and engineering dealing with the various materials important for solid-state electronics including semiconductors, ceramics, and polymers. Emphasis on thermodynamic concepts and on defects in these materials. Materials preparation and modification methods for technological applications. Prerequisite: Engineering 83L. One course. *Tan*

**213. Physical Metallurgy.** An advanced materials science course focusing on the relationships between structure and properties in metals and alloys. Conceptual and mathematical models developed and analyzed for crystal structures, elastic and plastic deformation, phase transformations, thermodynamic behavior, and electrical and magnetic properties. Prerequisites: Engineering 83L and Mechanical Engineering 101L. One course. *Pearsall*

**214. Corrosion and Corrosion Control.** Environmental aspects of the design and utilization of modern engineering alloys. Theory and mechanisms of corrosion, particularly in seawater and atmospheric environments. Microstructural aspects of diffusion, oxidation, hot corrosion, and stress corrosion. Prerequisite: Engineering 83L. One course. *Jones*

**215. Biomedical Materials and Artificial Organs.** Prerequisite: Biomedical Engineering 83L, Chemistry 151L or Engineering 83L or consent of instructor. See C-L: Biomedical Engineering 215. One course. *Reichert*

**216. Mechanical Metallurgy.** An advanced materials science course dealing with the response of materials to applied forces. Mechanical fundamentals; stress-strain relationships for elastic behavior; theory of plasticity. Metallurgical fundamentals; plastic deformation, dislocation theory; strengthening mechanisms. Mechanical behavior of polymers. Applications to materials testing. Prerequisites: Engineering 75L and Engineering 083L. One course. *Jones*

**217. Fracture of Engineering Materials.** Conventional design concepts and their relationship to the occurrence of fracture. Linear elastic and general yield fracture mechanics. Microscopic plastic deformation and crack propagation. The relationship between macroscopic and microscopic aspects of fracture. Time dependent fracture. Fracture of specific materials. Prerequisites: Engineering 83L and Mechanical Engineering 115L. One course. *Jones*

**218. Thermodynamics of Electronic Materials.** Basic thermodynamic concepts applied to solid state materials with emphasis on technologically relevant electronic materials such as silicon and GaAs. Thermodynamic functions, phase diagrams, solubilities and thermal equilibrium concentrations of point defects; nonequilibrium processes and the kinetic phenomena of diffusion, precipitation, and growth. One course. *Tan*

**219. Thin Film Processing.** Thin film deposition processes for the fabrication of electronic, photonic, and magnetic devices. Vacuum techniques, the control of growth of thin films on an atomic scale, and microanalytical techniques of thin film heterostructures. Prerequisite: Engineering 83L. One course. *Eom*



**220. X-Ray Diffraction.** The theory of X-ray diffraction and its relationship to structural determination in solids. Various X-ray diffraction techniques and laboratories, including single crystal diffraction, thin film diffraction, powder diffraction, grazing incident diffraction, and diffraction from layered materials are covered. Prerequisite: Engineering 83L. One course. *Eom*

**221. Compressible Fluid Flow.** Basic concepts of the flow of gases from the subsonic to the hypersonic regime. One-dimensional wave motion, the acoustic equations, and waves of finite amplitude. Effects of area change, friction, heat transfer, and shock on one-dimensional flow. Moving and oblique shock waves and Prandtl-Meyer expansion. One course. *Shaughnessy*

**222. Magnetic Materials.** The theory of magnetism, magnetic materials, and applications of magnetic materials. Various magnetic property measurement techniques and laboratories, including magnetization and magnetotransport measurements of magnetic thin films. Prerequisite: Engineering 83L. One course. *Eom*

**225. Mechanics of Viscous Fluids.** Equations of motion for a viscous fluid, constitutive equations for momentum and energy transfer obtained from second-law considerations, general properties and exact solutions of the Navier-Stokes and Stokes (creeping-flow) equations, applications to problems of blood flow in large and small vessels. One course. *Hochmuth*

**226. Intermediate Fluid Mechanics.** A survey of the principal concepts and equations of fluid mechanics, fluid statics, surface tension, the Eulerian and Lagrangian description, kinematics, Reynolds transport theorem, the differential and integral equations of motion, constitutive equations for a Newtonian fluid, the Navier-Stokes equations, and boundary conditions on velocity and stress at material interfaces. One course. *Shaughnessy or Thompson*

**227. Advanced Fluid Mechanics.** Flow of a uniform incompressible viscous fluid. Exact solutions to the Navier-Stokes equation. Similarity methods. Irrotational flow theory and its applications. Elements of boundary layer theory. Prerequisite: Mechanical Engineering 226 or consent of instructor. One course. *Shaughnessy*

**228. Lubrication.** Derivation and application of the basic governing equations for lubrication; the Reynolds equation and energy equation for thin films. Analytical and computational solutions to the governing equations. Analysis and design of hydrostatic and hydrodynamic slider bearings and journal bearings. Introduction to the effects of fluid inertia and compressibility. Dynamic characteristics of a fluid film and effects of bearing design on dynamics of machinery. Prerequisites: Mathematics 111 and Mechanical Engineering 126L. One course. *Knight*

**229. Computational Fluid Mechanics and Heat Transfer.** An exposition of numerical techniques commonly used for the solution of partial differential equations encountered in engineering physics. Finite-difference schemes (which are well-suited for fluid mechanics problems); notions of accuracy, conservation, consistency, stability, and convergence. Recent applications of weighted residuals methods (Galerkin), finite-element methods, and grid generation techniques. Through specific examples, the student is guided to construct and assess the performance of the numerical scheme selected for the particular type of transport equation (parabolic, elliptic, or hyperbolic). One course. *Howle*

**230. Modern Control and Dynamic Systems.** Dynamic modeling of complex linear and nonlinear physical systems involving the storage and transfer of matter and energy. Unified treatment of active and passive mechanical, electrical, and fluid systems. State-space formulation of physical systems. Time and frequency-domain representation. Controllability and observability concepts. System response using analytical and



computational techniques. Lyapunov method for system stability. Modification of system characteristics using feedback control and compensation. Emphasis on application of techniques to physical systems. One course. *Garg*

**231. Adaptive Structures: Dynamics and Control.** Integration of structural dynamics, linear systems theory, signal processing, transduction device dynamics, and control theory for modeling and design of adaptive structures. Classical and modern control approaches applied to reverberant plants. Fundamentals of adaptive feedforward control and its integration with feedback control. Presentation of a methodical design approach to adaptive systems and structures with emphasis on the physics of the system. Numerous MATLAB examples provided with course material as well as classroom and laboratory demonstrations. One course. *Clark*

**232. Optimal Control.** Prerequisite: Electrical Engineering 141 or equivalent. See C-L: Electrical Engineering 246. One course. *Bushnell*

**235. Advanced Mechanical Vibrations.** Analytical and experimental procedures applied to the design of machines and systems for adequate vibration control. Determination of eigenvalues and eigenvectors by iteration and computer techniques, transfer matrices applied to lumped and distributed systems, analytical and numerical methods of obtaining the pulse response of plane and three-dimensional multimass systems, convolution and data processing, introduction to random vibration. One course. *Knight or Wright*

**236. Engineering Acoustics.** Fundamentals of acoustics including sound generation, propagation, reflection, absorption, and scattering. Emphasis on basic principles and analytical methods in the description of wave motion and the characterization of sound fields. Applications including topics from noise control, sound reproduction, architectural acoustics, and aerodynamic noise. Occasional classroom or laboratory demonstration. Prerequisites: Engineering 123L and Mathematics 111 or consent of instructor. One course. *Bliss*

**237. Aerodynamics.** Fundamentals of aerodynamics applied to wings and bodies in subsonic and supersonic flow. Basic principles of fluid mechanics and analytical methods for aerodynamic analysis. Two- and three-dimensional wing theory, slender-body theory, lifting surface methods, vortex and wave drag. Brief introduction to vehicle design, performance, and dynamics. Special topics such as unsteady aerodynamics, vortex wake behavior, and propeller and rotor aerodynamics. One course. *Bliss*

**238. Advanced Aerodynamics.** Advanced topics in aerodynamics. Conformal transformation techniques. Three-dimensional wing theory, optimal span loading for planar and nonplanar wings. Ground effect and tunnel corrections. Propeller theory. Slender wing theory and slender body theory, transonic and supersonic area rules for minimization of wave drag. Numerical methods in aerodynamics including source panel and vortex lattice methods. Prerequisite: Mechanical Engineering 237. One course. *Hall*

**239. Unsteady Aerodynamics.** Analytical and numerical methods for computing the unsteady aerodynamic behavior of airfoils and wings. Small disturbance approximation to the full potential equation. Unsteady vortex dynamics. Kelvin impulse and apparent mass concepts applied to unsteady flows. Two-dimensional unsteady thin airfoil theory. Time domain and frequency domain analyses of unsteady flows. Three-dimensional unsteady wing theory. Introduction to unsteady aerodynamic behavior of turbomachinery. Prerequisite: Mechanical Engineering 237. One course. *Hall*

**240. Patent Technology and Law.** The use of patents as a technological data base is emphasized including information retrieval in selected engineering disciplines. Fundamentals of patent law and patent office procedures. Consent of instructor required. One course. *Cocks*

**245. Applications in Expert Systems.** A comprehensive introduction to the key practical principles, techniques, and tools being used to implement knowledge-based systems. The classic MYCIN system studied in detail to provide historic perspective. Current systems employing combinations of production rules, prototypical knowledge, and frame-based case studies. Student term projects consist of the development of individual, unique expert systems using the Texas Instruments Personal Consultant. Knowledge of LISP not a prerequisite. One course. *Wright*

**252. Buckling of Engineering Structures.** Prerequisite: Civil Engineering 131L or consent of instructor. See C-L: Civil Engineering 252. One course. *Virgin*

**263. Multivariable Control.** Prerequisites: a course in linear systems and classical control, or consent of instructor. See C-L: Civil Engineering 263; also C-L: Electrical Engineering 263. One course. *Bushnell, Clark, Gavin, or H. Wang*

**265. Advanced Topics in Mechanical Engineering.** Opportunity for study of advanced subjects related to programs within mechanical engineering tailored to fit the requirements of a small group. Approval of director of undergraduate or graduate studies required. Variable credit. *Staff*

**268. Cellular and Biosurface Engineering.** A combination of fundamental concepts in materials science, colloids, and interfaces that form a basis for characterizing: the physical properties of biopolymers, microparticles, artificial membranes, biological membranes, and cells; and the interactions of these materials at biofluid interfaces. Definition of the subject as a coherent discipline and application of its fundamental concepts to biology, medicine, and biotechnology. Prerequisite: Mechanical Engineering 208 or consent of instructor. One course. *Needham*

**270. Robot Control and Automation.** Review of kinematics and dynamics of robotic devices; mechanical considerations in design of automated systems and processes, hydraulic and pneumatic control of components and circuits; stability analysis of robots involving nonlinearities; robotic sensors and interfacing; flexible manufacturing; man-machine interaction and safety consideration. Prerequisites: Mechanical Engineering 230 or equivalent and consent of instructor. One course. *Garg*

**275. Product Safety and Design.** An advanced engineering design course that develops approaches to assessing and improving the safety of products and product systems. Safety is presented in terms of acceptable risk and analyzed through legal case studies. Probabilistic decision making; risk economics; risk analysis and assessment. Corequisite: Mechanical Engineering 160L. One course. *Pearsall*

**276. Designs and Decisions.** Successful engineering entrepreneurship requires both the creation of new devices and processes and the ability to make rational selections among design alternatives. Design methodology is presented that fosters creativity and introduces TRIZ (the Russian acronym for Theory of Inventive Problem Solving). Decisions among design alternatives are structured and analyzed in graphical and probabilistic terms: tree diagrams; sampling theory; hypothesis testing; and confidence levels. Corequisite: Mechanical Engineering 160L or consent of instructor. One course. *Pearsall*

**277. Optimization Methods for Mechanical Design.** Definition of optimal design. Methodology of constructing quantitative mathematical models. Nonlinear programming methods for finding "best" combination of design variables: minimizing steps, gradient methods, flexible tolerance techniques for unconstrained and constrained problems. Emphasis on computer applications and term projects. Consent of instructor required. One course. *Wright*

**280. Convective Heat Transfer.** Models and equations for fluid motion, the general energy equation, and transport properties. Exact, approximate, and boundary layer solutions for laminar flow heat transfer problems. Use of the principle of similarity and analogy in the solution of turbulent flow heat transfer. Two-phase flow, nucleation, boiling, and condensation heat and mass transfer. One course. *Bejan*

**281. Fundamentals of Heat Conduction.** Fourier heat conduction. Solution methods including separation of variables, transform calculus, complex variables. Green's function will be introduced to solve transient and steady-state heat conduction problems in rectangular, cylindrical, and spherical coordinates. Microscopic heat conduction mechanisms, thermophysical properties, Boltzmann transport equation. Prerequisite: Mathematics 111 or consent of instructor. One course. *Bejan*

**282. Fundamentals of Thermal Radiation.** Radiative properties of materials, radiation-materials interaction and radiative energy transfer. Emphasis on fundamental concepts including energy levels and electromagnetic waves as well as analytical methods for calculating radiative properties and radiation transfer in absorbing, emitting, and scattering media. Applications cover laser-material interactions in addition to traditional areas such as combustion and thermal insulation. Prerequisite: Mathematics 111 or consent of instructor. One course. *Staff*

**290. Physical Oceanography.** Introduction to the dynamic principles of ocean circulation with an emphasis on large temporal and spatial scales of motion. Topics include wind-driven and density-driven flow, western boundary intensification, mid-ocean, shelf, and tropical circulations. Prerequisites: Mathematics 31 and 32 or consent of instructor. C-L: Environment 290 and Earth and Ocean Sciences 203. One course. *Lozier*

## **COURSES CURRENTLY UNSCHEDULED**

**102. Thermodynamics II.**

**113. Introduction to Electronic Materials.**

**208. Introduction to Colloid and Surface Science.**

**224. An Introduction to Turbulence.**

## **THE MAJOR**

The major requirements are included in the minimum total of thirty-four courses listed under the general requirements and departmental requirements. Specific courses which must be included are Engineering 75L, 83L, and 123L; Mechanical Engineering 101L, 125L, 126L, 141L, 150L, and 160L; Electrical Engineering 148L.







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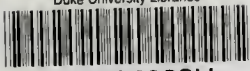
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